

**TRANSPORTABLE CONTAINER****FIELD OF THE INVENTION**

This invention relates to a transportable container and more particularly a container for the transportation of liquid materials of a type such as bitument (asphalt) which are very viscous or at ambient temperatures can be close to their solidifying point.

BACKGROUND OF THE INVENTION

Bulk transportation of such materials as bitumen (asphalt) at temperatures less or greater than 100°C can typically be achieved by the use of so called ISO tanks. The ISO tank used for these purposes is a pressure vessel and therefore requires periodic inspection for certification. This inspection can be costly due to the need to interior clean the tank to bare metal for visual examination (which is a costly procedure) together with the costs and fees associated with certification, inspection and hydrotesting.

Such tanks include an insulation cover which presents a continual corrosion and maintenance problem due to normal moisture condensation from hot bitumen/cold air accumulating in the insulation area. Also, if the waterproof integrity of the sheathing is not maintained the insulation can become saturated from the ingress of water through the failure in the sheathing joints or through damage to the sheathing itself. Thus the tank can deteriorate from corrosion and/or the insulation properties break down. Such insulated tanks therefore often require the removal of the sheathing and insulation for re-certification purposes which generally takes place every five years.



OBJECT OF THE INVENTION

The object of the present invention is to provide a transportable container for such viscous materials, the container being of a type which does not suffer from the problems associated with pressure vessel type tanks and having in-built insulation.

The invention takes advantage of a change in the American Bureau of Shipping Regulations where bitumen transported at temperatures below 100°C is now not subject to the Hazardous Goods Regulations or IMDG Code and may therefore be transported in any non-specification bulk container.

SUMMARY OF THE INVENTION

Broadly the invention consists of a transportable container for a viscous material, the container comprising a hollow enclosed body defined by a rectangular base, side and end walls projecting upwardly therefrom and a top wall connected to side and end walls, inlet/outlet means an inlet for the loading and removal of viscous liquid product from the container and means for engagement of heater means whereby heat can be applied to product within the container.

Preferably the container is dimensioned in accordance with standard ISO container dimensions but of reduced



height. Preferably the container is substantially half the height of a standard 20 foot ISO container.

The invention may also be broadly said to consist of a method of transporting viscous material including heating viscous material to a temperature at which it is flowable into a transportable container of the type defined in the above broad definition of the transportation container, allowing the viscous material to substantially cool, transporting the container to a site at which unloading is to take place, locating a heat source with the container such as to apply heat to the viscous material by heat exchange within the container and drawing the heated viscous material from the container via outlet means.

Preferably, an insulation jacket is located over the container during heating of the viscous material within the container.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an elevated perspective view of the container according to the present invention,

Figure 2 is an end view of the container as shown in Figure 1,



Figure 3 is a cross-sectional view taken on line A-A of Figure 2,

Figure 4 is a partially sectioned top plan view of the container,

Figure 5 is a sectional cross-section on line B-B of Figure 4, and

Figure 6 is a detailed cross-sectional view of a breathing vent.

DESCRIPTION OF THE EMBODIMENT OF THE INVENTION

In the preferred form of the invention the container 10 is constructed substantially in accordance with the normal construction of a ISO container. The container 10 thus has a base 11, end walls 12, side walls 13 and top 14. The container is dimensioned in accordance with standard dimensions of an ISO container but with the height being less than an ISO container and preferably of half the height, eg approximately 1295mm.

Also in accordance with normal ISO container construction the side walls 13, end walls 12 and the top wall 14 are of corrugated construction for strength. The end walls 12 extend between top and bottom rails 15 and 16 and corner posts 17 while the side walls 13 also project between the corner posts 17 and top and bottom side rails 18 and 19. Once again, in accordance with standard construction, corner castings 20 are provided at each of the top and bottom corners. The top wall 14 likewise extends between the top rails 15 and top side rails 18. Wall 14 includes a manhole or inspection opening 21



which can also be used for loading and unloading if required. This is closed by a hinged lid 22.

According to the present invention the base 11 of the container includes a flat floor 23 which is supported on external U-shaped beams 24 which extend between the bottom side rails 19.

The container does not incorporate insulation in the walls.

Formed in one end wall 12 is a plurality of openings 25 which communicate with tubes 26 which extend for substantially the length of the floor of the container. These tubes 26 can be blind tubes terminating adjacent the opposite end wall or can be connected in pairs by a U-shaped connector piece 27. The tubes 26 are so dimensioned that an electric heater element (not shown) can be slid therein. However, with pairs of tubes connected by the U-shaped connector pieces 27 a burner (also not shown) can be engaged with the end of one tube while the other tube functions as a return exhaust. Thus by the insertion or coupling of the heater means product loaded within the container can be heated.

To this end the end wall 12 includes a thermometer nipple assembly 28 and a thermostat nipple assembly 29 for the mounting respectively of a thermometer and thermostat. Each assembly consists of a pocket which projects into



the container from the end wall. An annular wall 30 surrounds the open end of the thermometer nipple 28. This can be covered with a transparent cover plate 31 through which the thermometer can be viewed. A bung or like seal (not shown) is insertable into the open end of the thermostat nipple and is removable to enable the insertion of the thermostat.

Located below the thermostat and thermometer nipple assemblies is a recess 33 which incorporates a coupler assembly 34, the lowermost point of which is substantially level with the floor. Thus a valve (not shown) can be attached to the coupler assembly so that product within the container can flow out of the container. A hose/conduit can be attached to the valve when the container is being emptied. Loading can also take place via the gate valve/coupler assembly or through the manhole.

In the top wall 14 a free breathing atmospheric vent 35 with weather cover 36 is provided. This according to one form the vent is formed by an upwardly projecting length of tube 37 which opens into the interior of the container 10. A peripheral flange 38 is provided at the upper end of the tubular portion. The weather cover 36 has a downwardly depending peripheral skirt 39. The cover is bolted via fasteners 40 to the flange. Flanged portions 41 and 42 extending from the peripheral skirt and the top surface of the top wall respectively. These include



openings through which customs seals 43 can be engaged. The same or a similar arrangement can be used with the lidded manhole.

Preferably there is also provided at least one internal baffle plate 44 to reduce sloshing of product within the container when the container is being moved and the product is at elevated temperature.

In the drawings no forklift pockets are shown. This is because of restrictions on lifting tanks by forklift for fear of a risk of puncturing the tank walls by forklift forks thereby resulting in leakage from the tank. With the present invention the container is considered to constitute a tank thus it must be lifted either by established means such as locking the container to a top lifting container forklift, or attaching an overhead spreader bar to the locks associated with the top of the container or by placing the container on a container base that has forklift pockets.

In use a viscous material, more particularly bitumen, can be loaded into the container. After cooling and/or solidifying of the product the container can then be transported to a location where it is to be unloaded. To heat the bitumen to a temperature whereby it can freely flow through the outlet 34 electric heater elements are inserted into the heater tubes. Alternatively a diesel, petroleum, natural gas or similar burner can be attached

to one of each pair of heater tubes and a substantially L-shaped flue stack (not shown) can be inserted into the other or return exhaust tube, this flue stack extending upwardly beyond the top of the container. Means for supporting the flue stack in position can be provided.

Still further a heated fluid can be circulated through the tube 26 for heat exchange heating of the product in the container.

Upon the bitumen being heated to the required temperature it can be unloaded through a gate valve on the coupler assembly into a transfer conduit or the like.

In the preferred form of the invention an insulation jacket can be placed over the container at the time the bitumen is heated. This provides for heat retention during the heating process.

A container according to the present invention having the external dimensions of a normal 20 foot ISO container but of half the height can be loaded with just over 13 tonnes. However, as two such containers can be carried in the same space of a normal 20 foot ISO container there is considerable advantage in freighting 26 tonnes in a space normally limited to 20 tonnes and empty return costs achieved by use of the present container. As a result the maximum amount of bitumen can be transported in the available standard ISO container space.



The container does not require its own insulation and sheathing. This results not only in reduced manufacturing costs and reduced weight (with consequential lower shipping costs) but also leads to reduced certification survey costs. It is also envisaged that the container will be of robust structure. The loss of insulation properties and corrosion from the ingress of water will be obviated.



CLAIMS

1. A transportable container for a viscous material, the container comprising a hollow enclosed body defined by a rectangular base, side and end walls projecting upwardly therefrom and a top wall connected to side and end walls, inlet/outlet means for the loading and removal of viscous liquid product from the container and means for engagement of heater means whereby heat can be applied to product within the container.
2. A transportable container as claimed in claim 1 wherein the container is dimensioned in accordance with standard ISO container dimension but of reduced height.
3. A transportable container as claimed in claim 2 wherein the container is substantially half the height of a standard 20 foot ISO container.
4. A transportable container as claimed in any one of claims 1 to 3 wherein at least one opening is formed in a wall of the container, said opening communicating with a tube within the container whereby a heater means can be installed in the tube.
5. A transportable container as claimed in any one of claims 1 to 3 wherein a plurality of openings are formed in an end wall with each opening communicating with a



tube within the container whereby a heater means can be installed in each said tube.



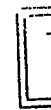
6. A transportable container as claimed in any one of claims 1 to 3 wherein at least one pair of openings is formed in an end wall with each opening communicating with a tube within the container, said tubes being coupled together at a point remote from said end wall whereby a burner type heater can be associated with one of the pair of the openings and gases can exhaust from the second of the pair of openings.

7. A transportable container as claimed in claim 6 wherein a flue-stack is engageable with said second opening.

8. A transportable container as claimed in claim 7 wherein the flue-stack is substantially L shaped with the foot portion thereof being engageable with said opening and the leg portion extending upwardly to terminate beyond the top wall of the container.

9. A transportable container as claimed in any one of the preceding claims further including a thermometer nipple assembly and a thermostat nipple assembly for the respective mounting of a thermometer and thermostat.

10. A transportable container as claimed in claim 9 wherein each assembly includes a pocket which projects



into the container and into which a thermometer or thermostat as the case may be can be inserted.



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11. A transportable container as claimed in any one of the preceding claims wherein the inlet/outlet means includes a coupler assembly located in a recess in a wall of the container, a valve means being coupled by the coupler assembly.

12. A transportable container as claimed in claim 11 wherein a manhole/inspection opening is provided in the top wall, said manhole/inspection opening also being capable of functioning as or part of the inlet/outlet means.

13. A transportable container as claimed in claim 11 or 12 wherein a free breathing atmospheric vent is provided in the top wall.

14. A transportable container as claimed in claim 13 wherein the vent includes a weather cover.

15. A transportable container as claimed in any one of the preceding claims wherein at least one internal baffle is located within the container.

16. A transportable container as claimed in any one of the preceding claims in combination with a removable

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insulation jacket engaged over and about the top, side and end walls of the container.



17. A method of transporting viscous material including heating viscous material to a temperature at which it is flowable into a transportable container of the type as claimed in any one of claims 1 to 16, allowing the viscous material to substantially cool, transporting the container to a site at which unloading is to take place, locating a heat source with the container such as to apply heat to the viscous material by heat exchange within the container and drawing the heated viscous material from the container via outlet means.

18. The method of claim 17 wherein an insulation jacket is located over the container during heating of the viscous material within the container.

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