insulation pads.

SUMMARY OF THE INVENTION

An aspect of the present disclosure is to provide an insulation structure of a cryogenic storage tank, capable of improving absorption of thermal shrinkage displacement of insulation pads caused by a cryogenic temperature and preventing a cryogenic liquid leaking out of a tank body from flowing out to the outside.

Further, another aspect of the present disclosure is to provide an insulation structure of a cryogenic storage tank, capable of reducing a time and expenses required for construction and improving efficiency of work.

In accordance with an aspect of the present disclosure, a cryogenic storage tank comprises a tank body and an insulation structure, wherein the insulation structure comprises: a plurality of insulation pads, wherein, in each of the plurality of insulation pads, an area of a lower insulation pad adjacent to the tank body is larger than that of an upper insulation pad, in which grooves are formed to extend from the lower insulation pad to the upper insulation pad, and in which a first crack stopper is provided at points at which the grooves are terminated across the upper insulation pad; a second crack stopper that is joined to a bottom of the lower insulation pad; and a protection sheet that is joined along an outer

surface of the upper insulation pad, wherein at least one or more gap pads for forming a fluid passage are located between the second crack stopper and the tank body, and are adhered to an outer surface of the tank body, the plurality of insulation pads are joined to form an empty space between the adjacent upper insulation pads, and spray foam is located in the empty space.

Further, the grooves of the insulation pads are preferably configured such that lengthwise grooves crossing the insulation pads in a lengthwise direction and widthwise grooves crossing the insulation pads intersect each other.

Further, a material of the first crack stopper is preferably a glass mesh.

Further, a material of the second crack stopper is preferably a glass mesh.

Further, grooves corresponding to the grooves of the insulation pads are preferably formed in the second crack stopper.

Further, the insulation pads are formed of polyurethane foam (PUF).

Further, the protection sheet is preferably an aluminum material, and is preferably adhered by an adhesive.

Further, a lengthwise groove is preferably formed in the spray foam.

WHAT IS CLAIMED IS:

1. A cryogenic storage tank comprising a tank body and an insulation structure, wherein the insulation structure comprises:

a plurality of insulation pads, wherein, in each of the plurality of insulation pads, an area of a lower insulation pad adjacent to the tank body is larger than that of an upper insulation pad, in which grooves are formed to extend from the lower insulation pad to the upper insulation pad, and in which a first crack stopper is provided at points at which the grooves are terminated across the upper insulation pad;

a second crack stopper that is joined to a bottom of the lower insulation pad; and

a protection sheet that is joined along an outer surface of the upper insulation pad,

wherein at least one or more gap pads for forming a fluid passage are located between the second crack stopper and the tank body, and are adhered to an outer surface of the tank body,

the plurality of insulation pads are joined to form an empty space between the adjacent upper insulation pads, and

spray foam is located in the empty space.

2. The cryogenic storage tank of claim 1, wherein lengthwise grooves crossing the insulation pads in a lengthwise direction and widthwise grooves crossing the insulation pads intersect each other at the insulation pads.

3. The cryogenic storage tank of claim 1, wherein the first crack stopper is formed of a glass mesh.

4. The cryogenic storage tank of claim 1, wherein the second crack stopper is formed of a glass mesh.

5. The cryogenic storage tank of claim 1, wherein grooves corresponding to the grooves of the insulation pads are formed in the second crack stopper.

6. The cryogenic storage tank of claim 1, wherein the insulation pads are formed of polyurethane foam (PUF).

7. The cryogenic storage tank of claim 1, wherein the protection sheet is formed of an aluminum material, and is adhered by an adhesive.

8. The cryogenic storage tank of claim 1, wherein a lengthwise groove is formed in the spray foam.

9. The cryogenic storage tank of claim 1, wherein the spray foam is formed of a polyurethane foam (PUF).

10. The cryogenic storage tank of claim 1, wherein a joint filler is further joined to an edge of the insulation pad at a fixed thickness, and is disposed between the insulation pad and the spray foam.

11. The cryogenic storage tank of claim 1, wherein an anchoring pad is further adhered to an upper side of the insulation pad.

12. The cryogenic storage tank of claim 1, wherein the plurality of insulation pads are supported on the outer surface of the tank body by a fastener.

13. The cryogenic storage tank of claim 12, wherein the fastener comprises a stud bolt.