[CLAIMS]

[Claim 1]

A liquefied gas-based rapid cooling possibility determination device comprising:

a first temperature detection unit configured to detect a temperature of a joining member which forms a part of a partition wall of a tank main body in which liquefied gas is contained, wherein a support member is joined to the joining member;

a second temperature detection unit configured to detect a temperature of the support member that supports the tank main body;

a temperature difference acquisition unit configured to acquire a temperature difference between the temperature of the joining member which is detected by the first temperature detection unit and the temperature of the support member which is detected by the second temperature detection unit; and

a determination unit configured to determine whether or not a joint between the tank main body and the support member is rapidly cooled by the liquefied gas, on the basis of at least two of the temperature of the joining member, the temperature of the support member, and the temperature difference.

[Claim 2]

The liquefied gas-based rapid cooling possibility determination device according to claim 1, wherein the second temperature detection unit detects a temperature of an upper part of the support member.

[Claim 3]

The liquefied gas-based rapid cooling possibility determination device according to claim 2, wherein the support member is configured such that an end thereof at a side joined to the partition wall has higher thermal conductivity than a portion thereof at a side separated from the partition wall.

[Claim 4]

The liquefied gas-based rapid cooling possibility determination device according to claim 1, wherein the determination unit determines whether or not the joint between the tank main body and the support member is rapidly cooled by the liquefied gas, on the basis of whether or not the temperature of the partition wall or the support member and the temperature difference are within a range within which stress generated at a joint between the partition wall and the support member when the tank main body is cooled by the liquefied gas is set to be lower than or equal to a predetermined reference value.

[Claim 5]

The liquefied gas-based rapid cooling possibility determination device according to claim 4, wherein the determination unit determines that rapid cooling of the tank main body caused by the liquefied gas into the tank is possible when the temperature of the partition wall is set to be lower than or equal to the predetermined reference value.

[Claim 6]

A liquefied gas storage tank comprising:

a tank main body configured to store liquefied gas;

a support member configured to support the tank main body;

a precooling part configured to precool the tank main body;

a gas feeder configured to feed the liquefied gas to the tank main body; and

the liquefied gas-based rapid cooling possibility determination device defined by claim 1.

[Claim 7]

A liquefied gas carrying vessel comprising:

the liquefied gas storage tank defined by claim 6; and

a hull in which the liquefied gas storage tank is mounted.

[Claim 8]

A liquefied gas-based rapid cooling possibility determination method comprising:

a process of detecting a temperature of a joining member which forms a part of a tank main body in which liquefied gas is contained, wherein a support member is joined to the joining member;

a process of detecting a temperature of the support member that supports the tank main body;

a process of acquiring a temperature difference between the temperature of the joining member and the temperature of the support member; and

a process of determining whether or not a joint between the tank main body and the support member is rapidly cooled by the liquefied gas, on the basis of at least two of the temperature of the joining member, the temperature of the support member, and the temperature difference.