Claims

1. A marine vessel fuel cooling apparatus, the fuel comprising a low-flashpoint fuel component in a container or a conduit, the apparatus comprising an absorption refrigeration cooler configured to supply chilled liquid to a cooling jacket of the container or the conduit to cool the low-flashpoint fuel component to a temperature below a flashpoint of the low-flashpoint fuel component.

2. The apparatus of claim 1, wherein the absorption refrigeration cooler is configured to be powered by waste heat from a marine vessel engine.

3. A marine vessel fuel cooling apparatus, the fuel comprising a low-flashpoint fuel component, the apparatus comprising an absorption refrigeration cooler configured to be powered by waste heat from a marine vessel engine.

4. The apparatus of any preceding claim, wherein the absorption refrigeration cooler is a lithium bromide water chiller.

5. The apparatus of claim 4, wherein the absorption refrigeration cooler comprises a hot air coil for conveying exhaust gas from the marine vessel engine, and wherein the absorption refrigeration cooler is configured to discharge the exhaust gas, after having passed through the absorption refrigeration cooler, for final exhausting through a chimney of the marine vessel.

6. The apparatus of any of claims 1 to 3, wherein the absorption refrigeration cooler is configured to be powered by waste heat from a main marine vessel engine.

7. The apparatus of any of claims 1 to 3, wherein the absorption refrigeration cooler is configured to be powered by waste heat from an auxiliary marine vessel engine.

8. The apparatus of any of claims 1 to 3 configured to supply chilled liquid at a temperature less than or equal to 11°C , preferably less than or equal to 9°C, more preferably less than or equal to 7°C, and even more preferably less than or equal to 5°C.

9. The apparatus of any of claims 1 to 3 configured to supply chilled liquid to cool a fuel comprising a low-flashpoint fuel component which is an alcohol.

10. The apparatus of any of claims 1 to 3 configured to supply chilled liquid to cool a fuel comprising dimethyl ether.

11. The apparatus of any of claims 1 to 3 further comprising a second stage cooler comprising a compression refrigeration cooler.

12. On-board marine vessel engine fuel mixing apparatus, the fuel comprising a low-flashpoint fuel component and an ether component, the apparatus being arranged to receive the low-flashpoint fuel component from a first on-board container and to receive the ether component from a second on-board container, the apparatus comprising a mixer for mixing the low flashpoint fuel component and the ether component to produce a marine vessel engine fuel mixture.

13. The apparatus of claim 12 , further comprising a delivery system for delivering the marine vessel engine fuel mixture to a fuel injector of a marine vessel engine.

14. An ISO tank container configured as a marine vessel main engine fuel tank, and configured to store a low-flashpoint liquid fuel component.

15. The ISO tank container of claim 14, wherein the ISO tank container comprises a cooler for receiving chilled liquid, and for cooling the low-flashpoint liquid fuel component.

16. The ISO tank container of claim 14 or claim 15, wherein the ISO tank container comprises a nitrogen blanket.

17. The ISO tank container of claim 14 or claim 15, wherein the ISO tank container is adapted for installation, or intended to be installed, aft of the main navigational bridge.

18. The ISO tank container of claim 14 or claim 15, wherein the ISO tank container is a movable tank adapted for installation, or intended to be installed, on or above deck of a marine vessel.

19. A method of cooling a low-flashpoint fuel component in a container or a conduit, the cooling being effected using a marine vessel fuel cooling apparatus comprising an absorption refrigeration cooler, the method comprising supplying chilled liquid from the absorption refrigeration cooler to a cooling jacket of the container or the conduit to cool the low-flashpoint fuel component to a temperature below a flashpoint of the low-flashpoint fuel component.

20. A method of operation of a marine vessel fuel cooling apparatus for cooling a low-flashpoint fuel component, the apparatus comprising an absorption refrigeration cooler, the method comprising powering the absorption refrigeration cooler by waste heat from a marine vessel engine.