CLAIMS

1. Use of a composition as an alternative for an existing working fluid in a heat transfer system, wherein the composition comprises:

(a) from 62 to 98 weight % carbon dioxide (R-744, CO_2);

(b) difluoromethane (R-32); and

(c) a third component selected from 1,1,1,2-tetrafluoroethane (R-134a), *trans*-1,3,3,3-tetrafluoropropene (R-1234ze(E)), 2,3,3,3-tetrafluoropropene (R-1234yf), 1,1,1,2,3,3,3-heptafluoropropane (R-227ea) and mixtures thereof,

wherein the existing working fluid is R-410A or R-407C,

further wherein the composition comprises 0.5% by weight or less of 1,1,2-trifluoroethylene (R-1123) or wherein the composition contains no R-1123.

2. The use according to claim 1, wherein the third component is R-134a and one or more of R-1234yf, R-1234ze(E) and R-227ea.

3. The use according to claim 1, wherein the third component is one or more of R-1234yf or R-1234ze(E).

4. The use according to claim 1, wherein the third component is one or more of R-1234yf, R-1234ze(E) and R-227ea.

5. The use according to any of the preceding claims, wherein the composition comprises from 65 to 98 weight % CO_2, such as from 69 to 97 weight %, for example from 74 to 96 weight % or from 81 to 96 weight %, optionally from 81 to 95 weight %.

6. The use according to any of the preceding claims, wherein the composition comprises from 1 to 25 weight % R-32, such as from 2 to 22 weight %, for example from 3 to 19 weight %, optionally from 4 weight % to 15 weight % or from 5 weight % to 11 weight %.

7. The use according to any of the preceding claims, wherein the composition comprises from 1 to 20 weight % of the third component, such as from 2 to 15 weight %, for example from 4 to 13 weight %, optionally from 5 to 11 weight %.

8. The use according to claim 1, wherein the composition comprises, optionally consists essentially of, from 65 to 95 weight % CO_2, from 5 to 15 weight % R-32 and from 2 to 20 weight % R-134a.

9. The use according to claim 8 wherein the CO_2 is present in the composition in an amount of from 70 to 91 weight %, the R-32 is present in an amount of from 6 to 14 weight % and the R-134a is present in an amount of from 3 to 16 weight %; preferably wherein the CO_2 is present in amount of from 72 to 88 weight %, the R-32 is present in an amount of from 8 to 13 weight % and the R-134a is present in an amount of from 4 to 15 weight %.

10. The use according to any of the preceding claims, wherein the composition additionally comprises 1,1-difluoroethylene (R-1132a).

11. The use according to claim 10, wherein the composition comprises from 1 to 20 weight % R-1132a, such as from 2 to 15 weight %, for example from 3 to 12 weight % or from 4 to 10 weight %.

12. The use according to any of the preceding claims, wherein the composition consists essentially of the stated components.

13. The use according to any of the preceding claims, wherein the composition is non-flammable as formulated, such as wherein the composition is not flammable as determined in accordance with ASHRAE Standard 34:2019

14. The use according to any of the preceding claims, wherein the composition has a Global Warming Potential (GWP) of less than 300, such as less than 240, such as less than 200, for example less than 160 or less than 150, preferably less than 145.

15. The use according to any of the preceding claims, wherein the composition has a critical temperature which is equal to or higher than the critical temperature of CO_2, for example higher than 40° C.

16. The use according to any of the preceding claims, wherein the composition has a volumetric refrigeration capacity that is within at least 75% of that of CO_2, such as within at least 80%, for example within at least 90%.

17. The use according to any of the preceding claims, wherein the composition has a coefficient of performance (COP) that is equal to or higher than that of CO_2.

18. The use according to any of the preceding claims, wherein the composition has an operating pressure in a gas cooler or evaporator that is lower than that of CO_2.

19. The use according to claims any of the preceding claims, wherein the composition has a temperature glide in an evaporator or condenser which is less than 12K, such as less than 10K, for example less than 8K, preferably less than 6K.

20. The use according to any of the preceding claims, wherein the composition further comprises a lubricant, preferably wherein the lubricant is selected from mineral oil, silicon oil, polyalkyl benzenes (PABs), polyol esters (POEs), polyalkylene glycols (PAGs), polyalkylene glycol esters (PAG esters), polyvinyl ethers (PVEs), poly (alpha-olefins) and combinations thereof.

21. The use according to claim 20, wherein the lubricant is selected from PAGs, POEs, PVEs and combinations thereof.

22. The use according to any of the preceding claims, wherein the heat transfer system is a refrigeration, heat pump or air-conditioning system.

23. The use of claim 22, wherein the refrigeration system comprises a commercial refrigeration system, such as a supermarket display refrigeration system, beverage cooler refrigeration system, warehouse refrigeration system or a cold-room refrigeration system.

24. The use of claim 22, wherein the refrigeration system comprises a transportation refrigeration system, such as a refrigeration system fitted to a refrigerating shipping container or a refrigeration system fitted to a vehicle.

25. The use of claim 22, wherein the heat pump system comprises a water heater heat pump system.

26. The use of claim 22 wherein the air-conditioning system comprises a mobile or transportation air-conditioning system, such as a bus, car, train or truck air-conditioning system.

27. The use of any of claims 22 to 26, wherein the heat transfer system operates as a transcritical heat transfer system for at least part of the year.