CLAIMS

1. A composition comprising:

(i) from about 2 to about 50% by weight 1,1-difluoroethene (vinylidene fluoride, R-1132a);

(ii) from about 2 to about 98% by weight difluoromethane (R-32); and

(iii) 2,3,3,3-tetrafluoropropene (R-1234yf).

2. A composition according to claim 1 comprising from about 2 to about 40% by weight R-1132a, such as from about 2 or about 3 to about 30% by weight, for example from about 3 or about 5 to about 20% by weight.

3. A composition according to claims 1 or 2 comprising from about 5 to about 90% by weight R-32, optionally from about 10 to about 80% by weight, or from about 15 to about 70% by weight.

4. A composition according to any of claims 1 to 3 comprising from about 1 to about 99% by weight R-1234yf, such as from about 2 to about 98% by weight, for example from about 5 to about 90% by weight, optionally from about 10 to about 75% by weight, or from about 10 to about 65% by weight.

5. A composition according to claim 1 comprising from about 2 to about 40% by weight R-1132a, from about 4 to about 94% by weight R-32, and from about 4 to about 94% by weight R-1234yf, for example from about 3 to about 30% by weight R-1132a, from about 10 to about 91% by weight R-32 and from about 6 to about 87% by weight R-1234yf, optionally from about 4 to about 25% by weight R-1132a, from about 15 to about 88% by weight R-32 and from about 8 to about 81% by weight R-1234yf.

6. A composition according to any of the preceding claims further comprising carbon dioxide (CO_2, R-744), optionally wherein the CO_2 is present in an amount of from about 1 to about 30% by weight, such as from about 2 to about 20% by weight, and/or wherein the R-1132a and CO_2 are present in a combined amount of from about 4 to about 50% by weight, such as from about 4 to about 40% by weight, for instance from about 4 to about 30% by weight, e.g. from about 5 to about 20% by weight.

7. A composition according to any of the preceding claims, wherein the composition further comprises 1,1,2-trifluoroethene (R-1123), optionally wherein the R-1123 is present in an amount of from about 1 to about 30% by weight, such as from about 5 to about 20% by weight;

or wherein the composition is substantially free of 1,1,2-trifluoroethene (R-1123), such wherein the composition contains no 1,1,2-trifluoroethene (R-1123).

8. A composition according to any of the preceding claims consisting essentially of the stated components.

9. A composition according to any of the preceding claims, wherein the composition has:

a. a higher flammable limit;

b. a higher ignition energy; and/or

c. a lower flame velocity;

compared to R-1132a alone,

for example wherein the composition is non-flammable, such as wherein the composition is non-flammable at ambient temperature, preferably wherein the composition is non-flammable at 60 °C.

10. A composition according to any of the preceding claims wherein the composition has a volumetric refrigeration capacity that is at least 90% of that of R-410A, and/or wherein the composition has a coefficient of performance (COP) that is equivalent or higher to that of R-410A; and/or wherein the composition has an operating pressure in a condenser equal to or lower than that of R-32, and/or wherein the composition has a compressor discharge temperature that is lower than that of R-32; and/or wherein the composition has a temperature glide in an evaporator or condenser of less than about 10K, preferably less than about 5K; and/or wherein the composition has a burning velocity of less than about 10 cm/s as measured by ASHRAE Standard 34.

11. A composition comprising a lubricant and a composition according to any of the preceding claims, optionally wherein the lubricant is selected from mineral oil, silicone oil, polyalkyl benzenes (PABs), polyol esters (POEs), polyalkylene glycols (PAGs), polyalkylene glycol esters (PAG esters), polyvinyl ethers (PVEs), poly (alpha-olefins) and combinations thereof, preferably wherein the lubricant is selected from PAGs or POEs .

12. A composition comprising a stabiliser and a composition according to any of the preceding claims, optionally wherein the stabiliser is selected from diene-based compounds, phosphates, phenol compounds and epoxides, and mixtures thereof.

13. A composition comprising a flame retardant and a composition according to any of the preceding claims, optionally wherein the flame retardant is selected from the group consisting of tri-(2-chloroethyl)-phosphate, (chloropropyl) phosphate, tri-(2,3-dibromopropyl)-phosphate, tri-(1,3-dichloropropyl)-phosphate, diammonium phosphate,

various halogenated aromatic compounds, antimony oxide, aluminium trihydrate, polyvinyl chloride, a fluorinated iodocarbon, a fluorinated bromocarbon, trifluoro iodomethane, perfluoroalkyl amines, bromo-fluoroalkyl amines and mixtures thereof.

14. A heat transfer device containing a composition as defined in any one of claims 1 to 13, such as wherein the heat transfer device is a refrigeration device, and/or wherein the heat transfer device comprises a residential or commercial air conditioning system, a heat pump or a commercial or industrial refrigeration system.

15. Use of a composition as defined in any one of claims 1 to 13 in a heat transfer device, preferably in a refrigeration device.

16. A method for cooling an article which comprises condensing a composition defined in any of claims 1 to 13 and thereafter evaporating the composition in the vicinity of the article to be cooled.

17. A method for heating an article which comprises condensing a composition as defined in any one of claims 1 to 13 in the vicinity of the article to be heated and thereafter evaporating the composition.

18. A mechanical power generation device containing a composition as defined in any of claims 1 to 45, optionally wherein the mechanical power generation device is adapted to use a Rankine Cycle or modification thereof to generate work from heat.

19. A method of retrofitting a heat transfer device comprising the step of removing an existing heat transfer composition, and introducing a composition as defined in any one of claims 1 to 45, such as wherein the heat transfer device is a commercial or industrial refrigeration device, a heat pump, or a residential or commercial air conditioning system, optionally wherein the heat transfer composition is a refrigerant selected from R-410A, R-454B, R-452B and R-32.

20. A method for reducing the environmental impact arising from the operation of a product comprising an existing compound or composition, the method comprising replacing at least partially the existing compound or composition with a composition as defined in any one of claims 1 to 45, optionally wherein the use of the composition of the invention results in a lower Total Equivalent Warming Impact, and/or a lower Life-Cycle Carbon Production than is attained by use of the existing compound or composition, optionally wherein the method is carried out on a product from the fields of air-conditioning, refrigeration, heat transfer, aerosols or sprayable propellants, gaseous dielectrics, flame suppression, solvents, cleaners, topical anaesthetics, and expansion applications, and/or wherein the product is

selected from a heat transfer device, a sprayable composition, a solvent or a mechanical power generation device, such as wherein the product is a heat transfer device, preferably a residential or commercial air conditioning system, a heat pump or a commercial or industrial refrigeration system, optionally wherein the existing compound or composition is a heat transfer composition, preferably wherein the heat transfer composition is a refrigerant selected from R-410A, R-454B, R-452B and R-32.