Claims

1. A system for producing an oil-in-water emulsion; the system comprising

a first input for coupling to a source of fuel on a vehicle;

a second input for coupling to a source of water;

a third input for coupling to a source of first additive;

a mixing section for mixing the water and the first additive to form an aqueous phase; and

a blender for blending the aqueous phase with the fuel to form the oil in water emulsion; wherein

the first input is coupled to the blender;

the second input and the third input are coupled to the mixing section; and

the mixing section is coupled to the blender;

and wherein

the first input comprises a first auxiliary output for coupling to the source of fuel on the vehicle; the second input comprises a second auxiliary output for coupling to the source of water; and/or the third input comprises a third auxiliary output for coupling to the source of first additive.

2. A system for producing an oil-in-water emulsion; the system comprising

a first input configured to accept a fuel source with a viscosity of less than 1000 cP at 50 °C and 100 s^{-1};

a second input for coupling to a source of water;

a third input for coupling to a source of first additive;

a mixing section for mixing the water and the first additive to form an aqueous phase; and

a blender for blending the aqueous phase with the fuel to form the oil in water emulsion; wherein

the first input is coupled to the blender;

the second input and the third input are coupled to the mixing section; and

the mixing section is coupled to the blender;

and wherein

the first input comprises a first auxiliary output for coupling to the source of fuel on the vehicle; the second input comprises a second auxiliary output for coupling to the source of water; and/or the third input comprises a third auxiliary output for coupling to the source of first additive.

3. A system according to claim 1 or 2, wherein the fuel comprises a marine fuel, biofuel, bio-oil, residual fuel oil, and/or distillate fuel oil.

4. A system according to any one of claims 1 to 3, wherein the first additive is one or more first additives.

5. A system according to any one of claims 1 to 4, wherein the mixing section comprises a mixer, optionally an inline mixer.

6. A system according to any one of claims 1 to 5, wherein:

(i) the mixing section is coupled directly to the blender; or

(ii) the system comprises an intermediate section and the mixing section is coupled to the intermediate section and the intermediate section is coupled to the blender.

7. A system according to any one of claims 1 to 6, wherein:

(i) the first input is coupled directly to the blender; or

(ii) the system comprises an intermediate section and the first input is coupled to the intermediate section and the intermediate section is coupled to the blender.

8. A system according to claim 6 or 7, wherein the intermediate section is configured to combine the fuel from the first input and the aqueous phase from the mixing section at a combining point; optionally wherein the distance from the combining point to the blender is less than 0.1 m; optionally less than 0.05 m or less than 0.01 m

9. A system according to any one of claims 1 to 8, wherein the blender is a milling machine, a mixing machine, or a homogeniser.

10. A system according to any one of claims 1 to 9, wherein the system comprises an output for coupling to an engine of a vehicle; optionally wherein the output is an output of the blender or is coupled to an output of the blender.

11. A system according to claim 10, wherein:

(i) the output is for coupling directly to the engine; or

(ii) the system comprises an intermediate output section for coupling to the engine of a vehicle and the output is coupled to the intermediate output section.

12. A system according to claim 11, wherein the intermediate output section comprises a first container having an internal volume from 10 litres to 40000 litres.

13. A system according to claim 12, wherein the first container comprises a first container output for coupling to the engine of a vehicle; optionally wherein the first container output is coupled to one or more of the intermediate section, the blender, the output, the first container, and/or the intermediate output section.

14. A system according to any one of claims 11 to 13, wherein the intermediate output section comprises a second container having an internal volume from 1 litre to 100 litres; optionally wherein the second container comprises a second container output that is coupled to one or more of the intermediate section, the blender, the output, and/or the intermediate output section.

15. A system according to any one of claims 11 to 14, wherein the intermediate output section comprises one or more flow directors that are configured to allow a flow of fluid from the blender to be provided to the first container and/or the second container.

16. A system according to any one of claims 1 to 15, wherein the system comprises a fourth input for coupling to a source of second additive, and coupled to the mixing section.

17. A system according to any one of claims 1 to 16, wherein the system comprises one or more heaters.

18. A system according to any one of claims 1 to 17, wherein the system comprises one or more viscometers; optionally the output or the intermediate output section comprises a viscometer.

19. A system according to any one of claims 1 to 18, wherein the system comprises one or more particle size analysers; optionally the output or the intermediate output section comprises a particle size analyser.

20. A system according to any one of claims 1 to 19, wherein the system comprises one or more controllers configured to receive an output from one or more of a flow regulator, blender, mixer, pump, heater, viscometer, and/or particle size analyser and output a controlling signal to one or more of a flow regulator, blender, mixer, pump, heater, viscometer, and/or particle size analyser.

21. A system according to any one of claims 1 to 20, wherein the vehicle is a vessel, optionally a marine vessel.

22. A vehicle comprising the system according to any of claims 1 to 21, optionally wherein the vehicle is a vessel.

23. Use of a system according to any of claims 1 to 21 to produce an oil-in-water emulsion on a vehicle, optionally wherein the vehicle is a vessel.

24. A process of forming an oil-in-water emulsion using the system according to any of claims 1 to 21.