CLAIMS

1. An aviation fuel blend having a measured viscosity of 12 mm^2/s or below at -40°C, and 10 mm^2/s or below at -30°C, measured in accordance with an EN ISO 3104 (1996) standard, in which the measured viscosity is at least 0.032 mm^2/s lower than a calculated viscosity Cs_B for the aviation fuel blend,

wherein the aviation fuel blend consists of:

- petroleum-derived jet fuel in an amount of up to 95 vol-%, and
- renewable paraffinic middle distillate fuel in an amount of 5-40 vol-%;

the calculated viscosity Cs_B being calculated for the aviation fuel blend based on a viscosity of the petroleum-derived jet fuel and a viscosity of the renewable paraffinic middle distillate fuel, at a respective temperature by using a formula (III):

$$Cs_B=EXP([(VBI_B)*LN(1000)] / [1-VBI_B]) \quad \text{(III)},$$

where $VBI_B= \sum V_i VBI_i$,
where V_i is a volume ratio of a fuel in the aviation fuel blend, and
$VBI_i= [LN(Cs_i)] / [LN(1000*Cs_i)]$,
where VBi is a viscosity index for the fuel, and
Cs_i is a viscosity of the fuel;

wherein the renewable paraffinic middle distillate fuel is produced from one or more of vegetable oil, animal fat, fish fat, palm oil, rapeseed oil, cooking oil, waste fat from a food industry, biogas, algae oil, jatropha oil, soybean oil, microbial oil, hydrogenated fatty acid and triglyceride materials;

wherein the petroleum-derived jet fuel complies with at least one aviation fuel standard selected from ASTM D1655, DEFSTAN 91-91, JET A, and JET A-1;

wherein the renewable paraffinic middle distillate fuel contains

more than 70 wt-% C15 to C18 paraffins,
less than 20 wt-% paraffins smaller than C15 paraffins, and
less than 10 wt-% paraffins larger than C18 paraffins.

2. The aviation fuel blend according to claim 1, wherein the viscosity of the petroleum-derived jet fuel and the viscosity of the renewable paraffinic middle distillate fuel are measured in accordance with the EN ISO 3104 (1996) standard.

3. The aviation fuel blend according to claim 1 or 2, wherein the renewable paraffinic middle distillate fuel has distillation range from 130°C to 320°C.

4. The aviation fuel blend according to claim 3, wherein the renewable paraffinic middle distillate fuel has distillation range from 130°C to 290°C.

5. The aviation fuel blend according to claim 4, wherein the aviation fuel blend contains at least 30 vol-% of the renewable paraffinic middle distillate fuel.

6. The aviation fuel blend according to claim 5, wherein the aviation fuel blend contains at least 35 vol-% of the renewable paraffinic middle distillate fuel.

7. The aviation fuel blend according to claim 3, wherein the renewable paraffinic middle distillate fuel has distillation range from 170°C to 320°C.

8. The aviation fuel blend according to claim 7, wherein the aviation fuel blend contains from 10 vol-% to 15 vol-% of the renewable paraffinic middle distillate fuel.

9. The aviation fuel blend according to any one of claims 1 to 8, wherein the renewable paraffinic middle distillate fuel is an iso-paraffinic middle distillate fuel.

10. The aviation fuel blend according to any one of claims 1 to 9, wherein the renewable paraffinic middle distillate fuel contains aromatic compounds in an amount of at most 0.5 vol-%, iso-paraffins in an amount from at least 80 vol-%, rest being other paraffins.

11. The aviation fuel blend according to claim 10, wherein the renewable paraffinic middle distillate fuel contains iso-paraffins in an amount at least 90 vol-%.

12. The aviation fuel blend according to any one of claims 1 to 11, wherein the renewable paraffinic middle distillate fuel contains

more than 85 wt-% of C15 to C18 paraffins, ;

less than 10 wt-% of paraffins smaller than C15 paraffins, ; and

less than 5 wt-% of paraffins larger than C18 paraffins, .

13. The aviation fuel blend according to claim 12, wherein the renewable paraffinic middle distillate fuel contains

more than 90 wt-% of C15 to C18 paraffins;

less than 7 wt-% of paraffins smaller than C15 paraffins; and

less than 3 wt-% of paraffins larger than C18 paraffins.

14. The aviation fuel blend according to any one of claims 1 to 13,

wherein the aviation fuel blend has the measured viscosity of 8 mm^2/s or below at -20°C measured in accordance with an EN ISO 3104 (1996) standard.

15. The aviation fuel blend according to any one of claims 1 to 14, wherein

the hydrogenated fatty acid and/or triglyceride materials are obtained from waste streams.

16. A method for producing an aviation fuel blend having a measured viscosity of 12 mm^2/s or below at -40°C, and 10 mm^2/s or below at -30°C, measured in accordance with an EN ISO 3104 (1996) standard, in which the measured viscosity is at least 0.032 mm^2/s lower than a calculated viscosity Cs_B for the aviation fuel blend,

wherein petroleum-derived jet fuel and renewable paraffinic middle distillate fuel are mixed together in an amount consisting of 5-40 vol-% of the renewable paraffinic middle distillate fuel and up to 95 vol-% of petroleum-derived jet fuel, to obtain the aviation fuel blend;

the calculated viscosity Cs_B being calculated for the aviation fuel blend based on a viscosity of the petroleum-derived jet fuel and a viscosity of the renewable paraffinic middle distillate fuel, at a respective temperature by using a formula (III):

$$Cs_B=EXP([(VBI_B)*LN(1000)] / [1-VBI_B]) \quad \text{(III)},$$

where $VBI_B= \sum V_i VBI_i$,

where V_i is a volume ratio of a fuel in the aviation fuel blend, and

$VBI_i= [LN(Cs_i)] / [LN(1000*Cs_i)]$,

where VBi is a viscosity index for the fuel, and

Cs_i is a viscosity of the fuel;

wherein the renewable paraffinic middle distillate fuel is produced from one or more of vegetable oil, animal fat, fish fat, palm oil, rapeseed oil, cooking oil, waste fat from a food industry, biogas, algae oil, jatropha oil, soybean oil, microbial oil, hydrogenated fatty acid and triglyceride materials;

wherein the petroleum-derived jet fuel complies with at least one aviation fuel standard selected from ASTM D1655, DEFSTAN 91-91, JET A, and JET A-1;

wherein the renewable paraffinic middle distillate fuel contains

more than 70 wt-% of C15 to C18 paraffins,

less than 20 wt-% of paraffins smaller than C15 paraffins, and

less than 10 wt-% of paraffins larger than C18 paraffins.

17. The method according to claim 16, wherein the renewable paraffinic middle distillate fuel has distillation range from 130°C to 320°C.

18. The method according to claim 17, wherein the renewable paraffinic middle distillate fuel has distillation range from 130°C to 290°C.

19. The method according to claim 18, wherein the obtained aviation fuel blend contains up to 30 vol-% of the renewable paraffinic middle distillate fuel.

20. The method according to claim 19, wherein the obtained aviation fuel blend contains up to 35 vol-% of the renewable paraffinic middle distillate fuel.

21. The method according to claim 16, wherein the renewable paraffinic middle distillate fuel has distillation range from 170°C to 320°C.

22. The method as claimed in claim 21, wherein the obtained aviation fuel blend contains from 10 vol-% to 40 vol-% of the renewable paraffinic middle distillate fuel.

23. The method according to any one of claims 16 to 22, wherein the viscosity of the petroleum-derived jet fuel and the viscosity of the renewable paraffinic middle distillate fuel are measured in accordance with the EN ISO 3104 (1996) standard.

24. The method according to any one of claims 16 to 23, wherein the aviation fuel blend has the measured viscosity of 8 mm^2/s or below at -20°C measured in accordance with an EN ISO 3104 (1996) standard.

25. The method according to any one of claims 16 to 24, wherein

the hydrogenated fatty acid and/or triglyceride materials are obtained from waste streams.