CLAIMS

1. A method for in-situ cleaning one or more components of a gas turbine engine (10) characterised in that, the method comprises injecting a gel detergent (84) into at least a portion of the gas turbine engine (10) at a predetermined pressure, the gel detergent (84) comprising a plurality of abrasive particles suspended in a gel composition, the plurality of abrasive particles comprising organic material, the gel composition comprising a mixture of detergent particles dissolved in a gel reactant; and allowing the gel detergent (84) to flow across or within one or more of the components of the gas turbine engine (10) so as to clean one or more of the components.

2. The method of claim 1, wherein the gel composition comprises a viscosity of from about 1,000 to about 50,000 centipoise (cps) so as to maintain suspension of the abrasive particles in the gel composition but to also allow the composition to flow through the gas turbine engine (10).

3. The method of either of claim 1 or 2, wherein injecting the gel detergent (84) into the gas turbine engine (10) further comprises injecting the gel detergent (84) into at least one of an inlet of the gas turbine engine (10), one or more ports of the gas turbine engine (10), or one or more cooling passageways (88) of one or more of the components of the gas turbine engine (10).

4. The method of any preceding claim, further comprising rinsing the gel detergent (84) after the gel detergent (84) flows across or within one or more of the components, wherein the gel composition is water soluble.

5. The method of any preceding claim, further comprising determining the predetermined pressure as a function of at least one of the viscosity of the gel composition or the one or more components of the gas turbine engine (10).

6. The method of any preceding claim, further comprising adding at least one of a corrosion inhibitor or a pH buffer to the gel composition.

7. The method of any preceding claim, wherein the one or more components of the gas turbine engine (10) comprise at least one of a compressor (24), a high-pressure turbine (28), a low-pressure turbine (32), a combustor (26), a combustion chamber (62), a nozzle, one or more blades or vanes, a booster (22), or a casing of the gas turbine engine (10).

8. A gel detergent (84) for cleaning a component of a gas turbine engine (10), the gel detergent (84) comprising:

a gel composition comprising a mixture of detergent particles dissolved in a gel reactant; characterised in that the detergent further comprises a plurality of abrasive organic particles suspended in the gel composition, each of the plurality of abrasive particles comprising a particle diameter ranging from about 20 microns to about 500 microns.

9. The gel detergent (84) of claim 8, wherein the gel composition comprises a viscosity of from about 1,000 to about 50,000 centipoise (cps) so as to maintain suspension of the abrasive particles in the gel composition but to also allow the composition to flow through the gas turbine engine (10).

10. The gel detergent (84) of either of claim 8 or 9, wherein the plurality of abrasive particles comprise varying-sized particles.

11. The gel detergent (84) of claim 10, wherein the organic material comprises at least one of nut shells or fruit stone pits.

12. The gel detergent (84) of any of claims 8 to 11, wherein the gel composition further comprises at least one of a corrosion inhibitor or a pH buffer.

13. The gel detergent (84) of any of claims 8 to 12, wherein the gel reactant is water soluble and comprises a mixture of acrylic and carboxylic acids having a molecular weight range of from about 1,250,000 to about 3,000,000 Daltons.