CLAIMS

1. A radiation source comprising:

a nozzle configured to direct a stream of fuel droplets along a trajectory towards a plasma formation location;

a laser configured to direct laser radiation at the fuel droplets at the plasma formation location to generate, in use, a radiation generating plasma;

wherein the nozzle has an internal surface that is configured to prevent contamination present in fuel used to form the fuel droplets from being deposited on that internal surface.

2. The radiation source of claim 1, wherein the internal surface comprises a coating.

3. The radiation source of claim 2, wherein the coating provides a smoother or less sticky surface for the contamination than material on which the coating is applied.

4. The radiation source of claim 1 or claim 2, wherein the coating comprises polytetrafluoroethylene, or a material derived from a sol-gel coating process.

5. The radiation source of any preceding claim, wherein the coating is capable of withstanding a temperature of greater than 232°C.

6. The radiation source of claim 1, wherein the internal surface is a surface of a body of material used to form the nozzle.

7. The radiation source of claim 6, wherein the body of material comprises diamond, or a glass, or a metal, or a ceramic.

8. The radiation source of any preceding claim, wherein the fuel comprises tin, and/or wherein the contamination comprises tin oxide particles.

9. A lithographic apparatus, comprising:

the radiation source of any preceding claim;

an illumination system configured to provide the radiation beam;

a patterning device configured to impart the radiation beam with a pattern in its cross-section;

a substrate holder configured to hold a substrate; and

a projection system configured to project the patterned radiation beam onto a target portion of the substrate.

10. A nozzle for use in a liquid droplet generator, wherein the nozzle has an internal surface that is configured to prevent contamination present in liquid used to form the liquid droplets from being deposited on that internal surface.

11. A method of forming a nozzle for use in a liquid droplet generator, the method comprising:

forming a nozzle from a body of material; and

providing the nozzle with an internal surface configured to prevent contamination present in liquid used to form the liquid droplets from being deposited on that internal surface.

12. The method of claim 11, wherein a wet coating process is used to provide the internal surface in the form of a coating.

13. The method of claim 12, wherein the coating is provided using a sol-gel coating process, or using a coating in fluid suspension.

14. The method of claim 12 or claim 13, wherein a liquid used in the wet coating process is cured after being applied.

15. The method of claim 11, wherein the internal surface is provided by forming a conduit through the body of material used to form the nozzle.

CLAIMS

1. A radiation source comprising:

a nozzle configured to direct a stream of fuel droplets along a trajectory towards a plasma formation location;

a laser configured to direct laser radiation at the fuel droplets at the plasma formation location to generate, in use, a radiation generating plasma;

wherein the nozzle has an internal surface that is configured to prevent contamination present in fuel used to form the fuel droplets from being deposited on that internal surface, the internal surface comprising a coating and wherein the coating comprises polytetrafluoroethylene, or a material derived from a sol-gel coating process.

2. The radiation source of claim 1, wherein the coating provides a smoother or less sticky surface for the contamination than material on which the coating is applied.

3. The radiation source of any preceding claim, wherein the coating is capable of withstanding a temperature of greater than 232ºC.

4. The radiation source of claim 1, wherein the internal surface is a surface of a body of material used to form the nozzle.

5. The radiation source of claim 4, wherein the body of material comprises diamond, or a glass, or a metal, or a ceramic.

6. The radiation source of any preceding claim, wherein the fuel comprises tin, and/or wherein the contamination comprises tin oxide particles.

7. A lithographic apparatus, comprising:

the radiation source of any preceding claim;

an illumination system configured to provide the radiation beam;

a patterning device configured to impart the radiation beam with a pattern in its cross-section;

a substrate holder configured to hold a substrate; and

a projection system configured to project the patterned radiation beam onto a target portion of the substrate.

8. A nozzle for use in a liquid droplet generator of a radiation source, wherein the nozzle has an internal surface that is configured to prevent contamination present in liquid used to form the liquid droplets from being deposited on that internal surface, the internal surface comprising a coating and wherein the coating comprises polytetrafluoroethylene, or a material derived from a sol-gel coating process.

9. A method of forming a nozzle for use in a liquid droplet generator of a radiation source, the method comprising:

forming a nozzle from a body of material; and

providing the nozzle with an internal surface configured to prevent contamination present in liquid used to form the liquid droplets from being deposited on that internal surface and wherein a wet coating process is used to provide the internal surface in the form of a coating.

10. The method of claim 9, wherein the coating is provided using a sol-gel coating process, or using a coating in fluid suspension.

11. The method of claim 9 or claim 10, wherein a liquid used in the wet coating process is cured after being applied.

12. The method of claim 9, wherein the internal surface is provided by forming a conduit through the body of material used to form the nozzle.