CLAIMS

1. A mask blank substrate for EUV lithography, the mask blank substrate comprising a substrate having an electrically conductive film formed on a main surface of the substrate,

wherein a coefficient of static friction of an outer surface of the electrically conductive film, as measured by sliding a convex surface along the outer surface, is not less than 0.25.

2. The mask blank substrate according to claim 1, wherein the electrically conductive film is composed of a material comprising at least one material selected from tantalum and chromium.

3. The mask blank substrate according to claim 1, wherein the electrically conductive film is composed of a material comprising tantalum and boron.

4. The mask blank substrate according to any of claims 1 to 3, wherein the surface roughness (Rms) of the electrically conductive film is not more than 0.60 nm.

5. A mask blank substrate according to claim 1, comprising a multilayer reflective film formed on a main surface of the substrate at an opposite side of the substrate from the main surface on which the electrically conductive film is formed, wherein the multilayer reflective film is an alternately laminated layer of a high refractive index layer and a low refractive index layer.

6. The mask blank substrate according to claim 5, wherein a protective film is formed on the multilayer reflective film.

7. A reflective mask blank having an absorber film formed on the multilayer reflective film of the mask blank substrate according to claim 5.

8. A reflective mask having an absorber pattern, wherein the absorber pattern is patterned absorber film of the reflective mask blank according to claim 7.

9. A method of manufacturing a semiconductor device comprising forming a transfer pattern on a transferred substrate by carrying out a lithography process with an exposure apparatus using the reflective mask according to claim 8.

10. The mask blank substrate according to claim 2, wherein a nitrogen content of a surface layer of the electrically conductive film is less than 5 at%.

11. The mask blank substrate according to claim 2, wherein a nitrogen content of the electrically conductive film is a graded composition film so that the nitrogen content is higher at the side of the substrate and lower at the outer surface.

12. The mask blank substrate according to claim 2, wherein nitrogen is not contained in the electrically conductive film.

13. The mask blank substrate according to claim 3, wherein a content of boron is 5 at% to 30 at%.

14. The mask blank substrate according to claim 1, comprising an intermediate film between the substrate and the electrically conductive film.

15. The mask blank substrate according to claim 14, wherein the electrically conductive film is composed of a material comprising tantalum and boron, and the intermediate film is composed of a material comprising tantalum and oxygen.

16. A reflective mask blank having an absorber film formed on the protective film of the mask blank substrate according to claim 6.

17. A reflective mask having an absorber pattern, wherein the absorber pattern is a patterned absorber film in the reflective mask blank according to claim 16.

18. A method of manufacturing a semiconductor device comprising forming a transfer pattern on a transferred substrate by carrying out a lithography process with an exposure apparatus using the reflective mask according to claim 17.

19. The mask blank substrate according to claim 1, wherein a thickness of the electrically conductive film is not less than forty nanometers and not more than one hundred nanometers.

20. The mask blank substrate according to claim 1, wherein the convex surface is a surface of an electrically conductive material.