CLAIMS

1. A substrate with an electrically conductive film comprising:

a substrate having two main surfaces; and

an electrically conductive film formed on one of the main surfaces of the substrate,

wherein the electrically conductive film comprises at least one of tantalum and chromium, and

a nitrogen content of a surface layer of the electrically conductive film is less than 5 at %.

2. The substrate with an electrically conductive film according to claim 1, wherein the electrically conductive film comprises tantalum and boron.

3. The substrate with an electrically conductive film according to claim 2, wherein a boron content of the electrically conductive film is in the range of from 5 at % to 30 at %.

4. The substrate with an electrically conductive film according to any of claims 1 to 3, wherein the electrically conductive film does not contain nitrogen.

5. The substrate with an electrically conductive film according to any of claims 1 to 4, wherein the substrate with an electrically conductive film comprises an intermediate film between the substrate and the electrically conductive film.

6. The substrate with an electrically conductive film according to claim 5, wherein the electrically conductive film comprises tantalum and boron, and the intermediate film comprises tantalum and oxygen.

7. A substrate with a multilayer reflective film comprising:

the substrate with an electrically conductive film according to any of claims 1 to 6, and

a multilayer reflective film formed on the other main surface of the substrate, wherein the multilayer reflective film is an alternately layered stack of a high refractive index layer and a low refractive index layer.

8. The substrate with a multilayer reflective film according to claim 7, wherein a protective film is formed on the multilayer reflective film.

9. A reflective mask blank comprising:

a substrate having two main surfaces;

an electrically conductive film formed on one of the main surfaces of the substrate;

a multilayer reflective film formed on the other main surface of the substrate, the multilayer reflective film being an alternately layered stack of a high refractive index layer and a low refractive index layer; and

an absorber film formed on the multilayer reflective film,

wherein the electrically conductive film comprises at least one of tantalum and chromium, and

a nitrogen content of a surface layer of the electrically conductive film is less than 5 at %.

10. The reflective mask blank according to claim 9, wherein the electrically conductive film comprises tantalum and boron.

11. The reflective mask blank according to claim 10, wherein a boron content of the electrically conductive film is in the range of from 5 at % to 30 at %.

12. The reflective mask blank according to any of claims 9 to 11, wherein the electrically conductive film does not contain nitrogen.

13. The reflective mask blank according to any of claims 9 to 12, wherein the substrate with an electrically conductive film comprises an intermediate film between the substrate and the electrically conductive film.

14. The reflective mask blank according to claim 13, wherein the electrically conductive film comprises tantalum and boron, and the intermediate film comprises tantalum and oxygen.

15. A reflective mask comprising:

a substrate having two main surfaces;

an electrically conductive film formed on one of the main surfaces of the

substrate;

a multilayer reflective film formed on the other main surface of the substrate, the multilayer reflective film being an alternately layered stack of a high refractive index layer and a low refractive index layer; and

an absorber pattern formed on the multilayer reflective film, the absorber pattern being a patterned absorber film,

wherein the electrically conductive film comprises at least one of tantalum and chromium, and

a nitrogen content of a surface layer of the electrically conductive film is less than 5 at %.

16. The reflective mask according to claim 15, wherein the electrically conductive film comprises tantalum and boron.

17. The reflective mask according to claim 16, wherein a boron content of the electrically conductive film is in the range of from 5 at % to 30 at %.

18. The reflective mask according to any of claims 15 to 17, wherein the electrically conductive film does not contain nitrogen.

19. The reflective mask according to any of claims 15 to 18, wherein the substrate with an electrically conductive film comprises an intermediate film between the substrate and the electrically conductive film.

20. The reflective mask according to claim 19, wherein the electrically conductive film comprises tantalum and boron, and the intermediate film comprises tantalum and oxygen.

21. 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 any of claims 15 to 20.