CLAIMS

1. A method of manufacturing an extreme ultraviolet (EUV) mask blank comprising:

forming on a substrate a multilayer stack which reflects EUV radiation, the multilayer stack comprising a plurality of reflective layer pairs;

forming a capping layer on the multilayer stack; and

forming an absorber layer on the capping layer, the absorber layer comprising an alloy of carbon and antimony, wherein the alloy of carbon and antimony comprises 3.0 wt.% to 27.1 wt.% carbon and 72.9 wt.% to 97 wt.% antimony.

2. A method of manufacturing an extreme ultraviolet (EUV) mask blank comprising:

forming on a substrate a multilayer stack which reflects EUV radiation, the multilayer stack comprising a plurality of reflective layer pairs;

forming a capping layer on the multilayer stack; and

forming an absorber layer on the capping layer, the absorber layer comprising an alloy of carbon and antimony, wherein the alloy of carbon and antimony comprises 35 wt.% to 55 wt.% carbon and 45 wt.% to 65 wt.% antimony.

3. The method of claim 1, wherein the alloy of carbon and antimony comprises 6.0 wt.% to 15 wt.% carbon and 85 wt.% to 94 wt.% antimony.

4. The method of claim 2, wherein the alloy of carbon and antimony comprises 45 wt.% to 52 wt.% carbon and 48 wt.% to 55 wt.% antimony.

5. The method of claim 1 or 2, wherein the alloy is formed by co-sputtering the carbon and antimony with a gas selected from one or more of argon (Ar), oxygen (O_2), or nitrogen (N_2) to form the absorber layer.

6. The method of claim 1 or 2, wherein the alloy is deposited layer by layer as a laminate of carbon and antimony layers using a gas selected from one or more of argon (Ar), oxygen (O_2), or nitrogen (N_2) to form the absorber layer.

7. The method of claim 1 or 2, wherein the alloy is deposited using a bulk target having the same composition as the alloy and is sputtered using a gas selected from one or more of argon (Ar), oxygen (O_2), or nitrogen (N_2) to form the absorber layer.

8. The method of claim 1, wherein the alloy of carbon and antimony is doped with one of more of nitrogen or oxygen in a range of from 0.1 wt.% to 5 wt.%.

9. The method of claim 2, wherein the alloy of carbon and antimony is doped with one of more of nitrogen or oxygen in a range of from 0.1 wt.% to 5 wt.%.

10. An extreme ultraviolet (EUV) mask blank comprising:

a substrate;

a multilayer stack which reflects EUV radiation, the multilayer stack comprising a plurality of reflective layer pairs;

a capping layer on the multilayer stack of reflecting layers; and

an absorber layer comprising an alloy of carbon and antimony, wherein the alloy of carbon and antimony comprises 3.0 wt.% to 27.1 wt.% carbon and 72.9 wt.% to 97 wt.% antimony.

11. An extreme ultraviolet (EUV) mask blank comprising:

a substrate;

a multilayer stack which reflects EUV radiation, the multilayer stack comprising a plurality of reflective layer pairs;

a capping layer on the multilayer stack of reflecting layers; and

an absorber layer comprising an alloy of carbon and antimony comprising 35 wt.% to 55 wt.% carbon and 45 wt.% to 65 wt.% antimony .

12. The extreme ultraviolet (EUV) mask blank of claim 10, wherein the alloy of carbon and antimony comprises 6.0 wt.% to 15 wt.% carbon and 85 wt.% to 94 wt.% antimony

13. The extreme ultraviolet (EUV) mask blank of claim 11, wherein the alloy of carbon and antimony comprises 45 wt.% to 52 wt.% carbon and 48 wt.% to 55 wt.% antimony.

14. The extreme ultraviolet (EUV) mask blank of claim 10 or 11, wherein the absorber layer has a thickness of less than 45 nm.

15. The extreme ultraviolet (EUV) mask blank of claim 10 or 11, wherein the absorber layer further comprises a range of rom 0.1 wt.% to 5 wt.% of a dopant selected from one or more of nitrogen or oxygen.

16. The extreme ultraviolet (EUV) mask blank of claim 15, wherein the absorber layer has a thickness of less than 45 nm.

17. The extreme ultraviolet (EUV) mask blank of claim 10 or 11, wherein the absorber layer is etch selective relative to the capping layer.