

What is claimed is:

1. A method of manufacturing an extreme ultraviolet (EUV) mask blank comprising:
 - 5 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 from about 0.3 wt.% to about 2.9 wt.% carbon and from
10 about 97.1 wt.% to about 99.7 wt.% antimony based upon the total weight of the alloy.
- 15 2. The method of claim 1, wherein the alloy of carbon and antimony comprises from about 5 wt.% to about 10.8 wt.% carbon and from about 89.2 wt.% to about 95 wt.% antimony.
- 20 3. The method of claim 2, wherein the alloy of carbon and antimony comprises from about 45 wt.% to about 52 wt.% carbon and from about 48 wt.% to about 55 wt.% antimony.
- 25 4. The method of claim 1, wherein the alloy is formed by co-sputtering the carbon and antimony with a gas selected from one or more of argon (Ar), oxygen (O₂), or nitrogen (N₂) to form the absorber layer.
5. The method of claim 1, 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 (O₂), or nitrogen (N₂) to form the absorber layer.
- 30 6. The method of claim 1, wherein the alloy is deposited using a bulk target having a composition that matches a composition of the alloy and is sputtered using a gas selected from one or more of argon (Ar), oxygen (O₂), or nitrogen (N₂) to form the absorber layer.

7. 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.%.
- 5 8. The method of claim 3, wherein the alloy of carbon and antimony is doped with one of more of nitrogen or oxygen in a range of from about 0.1 wt.% to about 5 wt.%.
9. An extreme ultraviolet (EUV) mask blank comprising:
- 10 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
- 15 an absorber layer comprising an alloy of carbon and antimony, wherein the alloy of carbon and antimony comprises from about 0.3 wt.% to about 2.9 wt.% carbon and from about 97.1 wt.% to about 99.7 wt.% antimony based upon the total weight of the alloy.
10. The extreme ultraviolet (EUV) mask blank of claim 9, the alloy of carbon and antimony comprises from about 5 wt.% to about 10.8 wt.% carbon and from about 89.2 wt.% to about 95 wt.% antimony.
- 20 11. The extreme ultraviolet (EUV) mask blank of claim 11, wherein the alloy of carbon and antimony comprises from about 45 wt.% to about 52 wt.% carbon and from about 48 wt.% to about 55 wt.% antimony.
- 25 12. The extreme ultraviolet (EUV) mask blank of claim 9, wherein the absorber layer has a thickness of less than 45 nm.
- 30 13. The extreme ultraviolet (EUV) mask blank of claim 9, wherein the absorber layer further comprises a range of from about 0.1 wt.% to about 5 wt.% of a dopant selected from one or more of nitrogen or oxygen.

14. The extreme ultraviolet (EUV) mask blank of claim 9, wherein the absorber layer has a thickness of less than 45 nm.
15. The extreme ultraviolet (EUV) mask blank of claim 9, wherein the absorber
5 layer is etch selective relative to the capping layer.
16. The extreme ultraviolet (EUV) mask blank of claim 9, wherein the plurality of reflective layer pairs include molybdenum (Mo) and silicon (Si).