

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; and
 - forming an absorber layer on the multilayer stack, the absorber layer selected from an alloy of tantalum and iridium; and an alloy of ruthenium and antimony.
- 10 2. The method of claim 1, wherein the alloy of tantalum and iridium comprises from about 14 wt.% to about 86 wt.% tantalum and from about 14 wt.% to about 86 wt.% iridium.
- 15 3. The method of claim 1, wherein the alloy of ruthenium and antimony comprises from about 4 wt.% to about 96 wt.% ruthenium and from about 4 wt.% to about 96 wt.% antimony.
- 20 4. The method of claim 2, wherein the alloy of tantalum and iridium is amorphous.
- 25 5. The method of claim 3, wherein the alloy of ruthenium and antimony is amorphous.
6. The method of claim 1, wherein the alloy is formed by co-sputtered tantalum and iridium with a gas selected from one or more of argon (Ar), oxygen (O₂), or nitrogen (N₂) to form the absorber layer.
- 30 7. The method of claim 1, wherein the alloy is deposited layer by layer as a laminate of alternate layers selected from tantalum and iridium layers and ruthenium and antimony layers using a gas selected from one or more of argon (Ar), oxygen (O₂), or nitrogen (N₂) to form the absorber layer.
8. The method of claim 1, wherein the alloy is deposited using a bulk target having a same composition as 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.

9. The method of claim 2, wherein the alloy of tantalum and iridium is doped with one of more of nitrogen or oxygen in a range of from 0.1 wt.% to 5 wt.%.
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10. The method of claim 1, wherein the alloy is doped with one of more of nitrogen or oxygen in a range of from about 0.1 wt.% to about 5 wt.%.
- 10 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; and
an absorber layer on the multilayer stack selected from an alloy of
15 tantalum and iridium; and an alloy of ruthenium and antimony.
12. The extreme ultraviolet (EUV) mask blank of claim 11, wherein the alloy of tantalum and iridium comprises from about 14 wt.% to about 86 wt.% tantalum and from about 14 wt.% to about 86 wt.% iridium.
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13. The extreme ultraviolet (EUV) mask blank of claim 11, the alloy of ruthenium and antimony comprises from about 4 wt.% to about 96 wt.% ruthenium and from about 4 wt.% to about 96 wt.% antimony.
- 25 14. The extreme ultraviolet (EUV) mask blank of claim 12, wherein the alloy of tantalum and iridium is amorphous.
15. The extreme ultraviolet (EUV) mask blank of claim 13, wherein the alloy of ruthenium and antimony is amorphous.
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16. The extreme ultraviolet (EUV) mask blank of claim 11, wherein the absorber layer has a thickness of less than 60 nm.

17. The extreme ultraviolet (EUV) mask blank of claim 11, 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.
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18. The extreme ultraviolet (EUV) mask blank of claim 11, wherein the absorber layer has a thickness of less than 60 nm.
19. The extreme ultraviolet (EUV) mask blank of claim 11, wherein the absorber layer is etch selective relative to the capping layer.
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20. 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 including molybdenum (Mo) and silicon (Si); and
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- an absorber layer on the multilayer stack selected from an alloy of tantalum and iridium and an alloy of ruthenium and antimony.