CLAIMS:

1. A method for coating a metal component of a gas turbine engine, the method comprising:

forming a cathode ingot for a cathodic arc deposition process, the cathode ingot comprising a base portion and an outer coating disposed over the base portion, wherein the base portion comprises an MCrAlY alloy and the outer coating comprises platinum-modified aluminide; and

performing a cathodic arc deposition process on the metal component with the cathode ingot to form a bond coat comprising:

a buffer coating disposed on a surface of the metal component, and comprising at least a portion of the platinum-modified aluminide of the outer coating of the cathode ingot; and

an overlay coating disposed over the buffer coating, and comprising at least a portion of the MCrAlY alloy of the base portion of the cathode ingot.

2. The method of claim 1, wherein the cathode ingot further comprises a transition region between the base portion and the outer coating, the transition region comprising a compositional gradient that transitions from the platinum-modified aluminide of the outer coating to the MCrAlY alloy of the base portion.

3. The method of claim 2, wherein the bond coat further comprises a transition coating disposed between the buffer coating and the overlay coating, the transition coating comprising a compositional gradient that transitions from the platinum-modified aluminide of the buffer coating to the MCrAlY alloy of the overlay coating.

4. The method of claim 1, wherein forming the cathode ingot comprises:

forming the base portion of the cathode ingot;

forming a platinum coating on the base portion to form a platinum-coated base portion; and

performing an aluminization process on the platinum-coated base portion.

5. The method of claim 4, further comprising performing at least one heat treatment process on the cathode ingot after performing the aluminization process.

6. The method of claim 1, further comprising forming a thermal barrier coating over the overlay coating.

7. A method for coating at least one metal component of a gas turbine engine, the method comprising:

forming a platinum coating on a base portion of a cathode ingot, the base portion comprising an MCrAlY alloy;

aluminizing the platinum-coated base portion to form an outer coating disposed over the base portion, the outer coating comprising platinum-modified aluminide;

inducing a cathodic arc to contact the outer coating of the cathode ingot, thereby forming metallic ions of the platinum-modified aluminide;

depositing the metallic ions of the platinum-modified aluminide onto the at least one metal component to form a buffer coating on the metal component;

inducing the cathodic arc to contact the base portion of the cathode ingot, thereby forming metallic ions of the MCrAlY alloy; and

depositing the metallic ions of the MCrAlY alloy over the buffer coating to form an overlay coating.

8. The method of claim 7, wherein the cathode ingot further includes a transition region between the base portion and the outer coating, the transition region comprising a compositional gradient that transitions from the platinum-modified aluminide of the outer coating to the MCrAlY alloy of the base portion.

9. The method of claim 8, further comprising:

inducing the cathodic arc to contact the transition region of the cathode ingot, thereby forming metallic ions of the MCrAlY alloy of the transition region

and metallic ions of the platinum-modified aluminide of the transition region; and

depositing the metallic ions of the MCrAlY alloy of the transition region and metallic ions of the platinum-modified aluminide of the transition region over the buffer coating to form a transition coating.

10. The method of claim 7, wherein forming the platinum coating on the base portion of the cathode ingot comprises electroplating the base portion.

11. The method of claim 7, further comprising performing at least one heat treatment process on the cathode ingot after aluminizing the platinum-coated base portion.

12. The method of claim 7, further comprising forming a thermal barrier coating over the overlay coating.

13. A metal component of a gas turbine engine, the metal component comprising:

a substrate having a surface; and

a bond coat formed on the substrate with a cathodic arc deposition process using a cathode ingot, the bond coat comprising:

a buffer coating disposed on the surface of the substrate, and comprising a platinum-modified aluminide deposited on the surface from an outer layer of the cathode ingot; and

an overlay coating disposed over the buffer coating, and comprising an MCrAlY alloy deposited from a base portion of the cathode ingot.

14. The metal component of claim 13, wherein the substrate comprises an alloy selected from the group consisting of nickel-based superalloys, cobalt-based superalloys, and combinations thereof.

15. The metal component of claim 13, wherein the bond coat further comprises a transition coating disposed between the buffer coating and the overlay coating, the transition

coating comprising a compositional gradient that transitions from the platinum-modified aluminide of the buffer coating to the MCrAlY alloy of the overlay coating.

16. The metal component of claim 13, further comprising a thermal barrier coating disposed over the overlay coating.

CLAIMS:

1. A method for coating a metal component of a gas turbine engine, the method comprising:

forming a cathode ingot for a cathodic arc deposition process, the cathode ingot comprising a base portion and an outer coating disposed over the base portion, wherein the base portion comprises an MCrAlY alloy and the outer coating comprises platinum-modified aluminide; and

performing a cathodic arc deposition process on the metal component with the cathode ingot to form a bond coat comprising:

a buffer coating disposed on a surface of the metal component, and comprising at least a portion of the platinum-modified aluminide of the outer coating of the cathode ingot; and

an overlay coating disposed over the buffer coating, and comprising at least a portion of the MCrAlY alloy of the base portion of the cathode ingot.

2. The method of claim 1 wherein the cathodic arc deposition process comprises

inducing a cathodic arc to contact the outer coating of the cathode ingot, thereby forming metallic ions of the platinum-modified aluminide;

depositing the metallic ions of the platinum-modified aluminide onto the metal component to form a buffer coating on the metal component;

inducing the cathodic arc to contact the base portion of the cathode ingot, thereby forming metallic ions of the MCrAlY alloy; and

depositing the metallic ions of the MCrAlY alloy over the buffer coating to form an overlay coating.

3. The method of claim 1 or 2, wherein the cathode ingot further comprises a transition region between the base portion and the outer coating, the transition region comprising a compositional gradient that transitions from the platinum-modified aluminide of the outer coating to the MCrAlY alloy of the base portion.

4. The method of claim 3, wherein the bond coat further comprises a transition coating disposed between the buffer coating and the overlay coating, the transition coating comprising a compositional gradient that transitions from the platinum-modified aluminide of the buffer coating to the MCrAlY alloy of the overlay coating.

5. The method of claim 4, wherein the cathodic arc deposition process comprises

inducing a cathodic arc to contact the transition region of the cathode ingot, thereby forming metallic ions of the MCrAlY alloy of the transition region and metallic ions of the platinum-modified aluminide of the transition region; and

depositing the metallic ions of the MCrAlY alloy of the transition region and metallic ions of the platinum-modified aluminide of the transition region over the buffer coating to form a transition coating.

6. The method of any preceding claim, wherein forming the cathode ingot comprises:

forming the base portion of the cathode ingot;

forming a platinum coating on the base portion to form a platinum-coated base portion; and

performing an aluminization process on the platinum-coated base portion.

7. The method of claim 6, wherein forming the platinum coating on the base portion of the cathode ingot comprises electroplating the base portion.

8. The method of claim 6 or 7, further comprising performing at least one heat treatment process on the cathode ingot after performing the aluminization process.

9. The method of any preceding claim, further comprising forming a thermal barrier coating over the overlay coating.

10. The method of any preceding claim, wherein the bond coat has an average thickness ranging from about 25 micrometers to about 200 micrometers, preferably from about 50 micrometers to about 100 micrometers.

11. A metal component (42) of a gas turbine engine, the metal component comprising:

a substrate (44) having a surface (46); and

a bond coat (48) formed on the substrate with a cathodic arc deposition process using a cathode ingot, the bond coat comprising:

a buffer coating (50) disposed on the surface of the substrate, and comprising a platinum-modified aluminide deposited on the surface from an outer layer of the cathode ingot; and

an overlay coating (54) disposed over the buffer coating, and comprising an MCrAlY alloy deposited from a base portion of the cathode ingot.

12. The metal component of claim 11, wherein the substrate comprises an alloy selected from the group consisting of nickel-based superalloys, cobalt-based superalloys, and combinations thereof.

13. The metal component of claim 11 or 12, wherein the bond coat further comprises a transition coating (52) disposed between the buffer coating and the overlay coating, the transition coating comprising a compositional gradient that transitions from the platinum-modified aluminide of the buffer coating to the MCrAlY alloy of the overlay coating.

14. The metal component of claim 11, 12 or 13, further comprising a thermal barrier coating (56) disposed over the overlay coating (54).

15. The metal component of claim 11, 12, 13 or 14, wherein the bond coat (48) has an average thickness ranging from about 25 micrometers to about 200 micrometers, preferably from about 50 micrometers to about 100 micrometers.