WE CLAIM:

1. A polyurea coating composition comprising:

(A) an amine-functional component comprising:

(i) an aspartic ester-based amine-functional resin, and

(ii) a blocked primary amine; and

(B) an isocyanate-functional component comprising:

(i) a polyisocyanate having a functionality greater than 2.0 and an isocyanate equivalent weight of greater than 300, and

(ii) a silane,

wherein the aspartic ester-based amine-functional resin is present in an amount of at least 80 percent by weight, based on the sum of the weight of the aspartic ester-based amine-functional resin and the blocked primary amine.

2. The polyurea coating composition of claim 1, wherein the blocked primary amine comprises an aldimine.

3. The polyurea coating composition of claim 2, wherein the aldimine is a blocked isophoronediamine.

4. The polyurea coating composition of claim 1, wherein the aspartic ester-based amine-functional resin is present in an amount of at least 90 percent by weight, based on the sum of the weight of the aspartic ester-based amine-functional resin and the blocked primary amine.

5. The polyurea coating composition of claim 1, wherein the polyisocyanate having a functionality of greater than 2.0 and an isocyanate equivalent weight of greater than 300 comprises a mixture comprising:

(a) an aliphatic polyisocyanate resin based on hexamethylene diisocyanate; and

(b) an aliphatic polyisocyanate based on isophorone diisocyanate and hexamethylene diisocyanate.

6. The polyurea coating composition of claim 5, wherein (a) of the polyisocyanate mixture is present in an amount of at least 70 percent by weight, based on the sum of the weight of (a) and (b).

7. The polyurea coating composition of claim 1, wherein the silane is an isocyanatosilane or a methacryloxy silane.

8. The polyurea coating composition of claim 7, wherein the isocyanatosilane corresponds to the formula:

$$OCN\text{--}Y\text{--}Si\text{--}(X)_3$$

wherein X represents an alkyl or alkoxy group having 1 to 4 carbon atoms and Y represents a linear or branched alkylene group containing 1 to 8 carbon atoms.

9. The polyurea coating composition of claim 8, wherein X represents methoxy, ethoxy or propoxy and Y is a linear group containing 3 carbon atoms.

10. The polyurea coating composition of claim 1, wherein the silane is present in an amount of at least 1 percent by weight, based on the total weight of isocyanate-functional components in the coating composition and no more than 10 percent by weight, based on the total weight of isocyanate-functional components in the coating composition.

11. The polyurea coating composition of claim 1, further comprising an alkoxy-functional and/or silanol-functional silicone.

12. The polyurea coating composition of claim 1, wherein the ratio of the equivalents of isocyanate groups to amine groups is 1.01:1 to 1.10:1.

13. A composite polyurea coating system comprising:

(I) a first coating layer; and

(II) a second coating layer deposited over at least a portion of the first coating layer, wherein the first coating layer and the second coating layer each independently comprise the cured reaction product of a composition comprising:

(A) an amine-functional component comprising (i) an aspartic ester-based amine-functional resin, and (ii) a blocked primary amine; and

(B) an isocyanate-functional component comprising (i) a polyisocyanate having a functionality greater than 2.0 and an isocyanate equivalent weight of greater than 300, and (ii) a silane,

wherein the first coating layer further comprises at least 70% by weight zinc, based on the total solids weight of the coating composition, and the aspartic ester-based amine-functional resin is present in an amount of at least 80 percent by weight, based on the sum of the weight of the aspartic ester-based amine-functional resin and the blocked primary amine.

14. The composite polyurea coating system of claim 13, wherein the isocyanate-functional component further comprises an isocyanatosilane or a methacryloxy silane.

15. A method of applying a polyurea coating composition to a substrate comprising:

(i) mixing (A) an amine-functional component comprising an aspartic ester-based amine-functional resin and a blocked primary amine with (B) an isocyanate-functional component comprising a polyisocyanate having a functionality greater than 2.0 and an isocyanate equivalent weight of greater than 300, and a silane, wherein the aspartic ester-based amine-functional resin is present in an amount of at least 80 percent by weight, based on the sum of the weight of the aspartic ester-based amine-functional resin and the blocked primary amine, and wherein the volume mixing ratio of the isocyanate functional component to the amine-functional component is capable of being applied to the substrate from 1:1 to 1:3; and

(ii) applying the mixed coating composition to the substrate.

16. The method of claim 15, wherein the silane comprises an isocyanatosilane or a methacryloxy silane.

17. A coating composition comprising:

(A) an amine-functional component comprising:

(i) an aspartic ester-based amine-functional resin, and

(ii) a blocked primary amine; and

(B) an isocyanate-functional component comprising:

(i) a polyisocyanate having a functionality greater than 2.0 and an isocyanate equivalent weight of greater than 300, wherein the polyisocyanate comprises a mixture comprising (a) an aliphatic polyisocyanate resin based on hexamethylene diisocyanate, and (b) an aliphatic polyisocyanate based on isophorone diisocyanate and hexamethylene diisocyanate, and

(ii) a silane.

18. The coating composition of claim 17, wherein (a) of the polyisocyanate mixture is present in an amount of at least 70 percent by weight, based on the sum of the weight of (a) and (b).

WE CLAIM:

1. A coating composition comprising:

(a) an amine-functional component comprising:

(i) an aspartic ester-based amine-functional resin; and

(ii) a blocked primary amine; and

(b) an isocyanate-functional component comprising:

(i) a polyisocyanate having a functionality greater than 2.0 and an isocyanate equivalent weight of greater than 300; and

(ii) a silane.

2. The coating composition of claim 1, wherein the blocked primary amine comprises an aldimine.

3. The coating composition of claim 2, wherein the aldimine is a blocked isophoronediamine.

4. The coating composition of claim 1, wherein the aspartic ester-based amine-functional resin is present in an amount of at least 80 percent by weight, based on the sum of the weight of the aspartic ester-based amine-functional resin and the blocked primary amine.

5. The coating composition of claim 4, wherein the aspartic ester-based amine-functional resin is present in an amount of at least 90 percent by weight, based on the sum of the weight of the aspartic ester-based amine-functional resin and the blocked primary amine.

6. The coating composition of claim 1, wherein the polyisocyanate having a functionality of greater than 2.0 and an isocyanate equivalent weight of greater than 300 comprises a mixture comprising:

(i) an aliphatic polyisocyanate resin based on hexamethylene diisocyanate; and

(ii) an aliphatic polyisocyanate based on isophorone diisocyanate and hexamethylene diisocyanate.

7. The coating composition of claim 6, wherein (ii) is present in an amount of at least 70 percent by weight, based on the sum of the weight of (i) and (ii).

8. The coating composition of claim 1, wherein the silane is an isocyanatosilane or a methacryloxy silane.

9. The coating composition of claim 8, wherein the isocyanatosilane corresponds to the formula:

$$OCN–Y–Si–(X)_3$$

wherein X represents an alkyl or alkoxy group having 1 to 4 carbon atoms and Y represents a linear or branched alkylene group containing 1 to 8 carbon atoms.

10. The coating composition of claim 9, wherein X represents methoxy, ethoxy or propoxy and Y is a linear group containing 3 carbon atoms.

11. The coating composition of claim 1, wherein the silane is present in an amount of at least 1 percent by weight, based on the total weight of isocyanate-functional components in the coating composition and no more than 10 percent by weight, based on the total weight of isocyanate-functional components in the coating composition.

12. The coating composition of claim 1, further comprising an alkoxy-functional and/or silanol-functional silicone.

13. The coating composition of claim 1, wherein the ratio of the equivalents of isocyanate groups to amine groups is 1.01 to 1.10:1.

14. A composite coating system comprising:

(a) a first coating layer deposited from a composition comprising at least 70% by weight zinc, based on the total solids weight of the coating composition; and

(b) a second coating layer deposited over at least a portion of the first coating layer, the second coating layer comprising the cured reaction product of a composition comprising:

(i) an amine-functional component comprising:

(A) an aspartic ester-based amine-functional resin; and

(B) a blocked primary amine; and

(ii) an isocyanate-functional component comprising:

(A) a polyisocyanate having a functionality greater than 2.0 and an isocyanate equivalent weight of greater than 300; and

(B) a silane.

15. The composite coating system of claim 14, wherein the first coating layer comprises the cured reaction product of a composition comprising an amine-functional component and an isocyanate-functional component.

16. The composite coating system of claim 15, wherein the amine-functional component of the first coating layer comprises an aspartic ester-based amine-functional resin.

17. The composite coating system of claim 15, wherein the isocyanate-functional component of the first coating layer comprises a polyisocyanate having a functionality greater than 2.0 and an isocyanate equivalent weight of greater than 300.

18. The composite coating system of claim 17, wherein the isocyanate-functional component further comprises an isocyanatosilane or a methacryloxy silane.

19. A method of applying a polyurea coating composition to a substrate comprising:

(a) mixing (i) an amine-functional component comprising an aspartic ester-based amine-functional resin and a blocked primary amine with (ii) an isocyanate-functional component comprising a polyisocyanate having a functionality greater than 2.0 and an isocyanate equivalent weight of greater than 300, and a silane, wherein the volume mixing ratio of the isocyanate-functional component to the amine-functional component is capable of being applied to the substrate from 1:1 to 1:3; and

(b) applying the mixed coating composition to the substrate.

20. The method of claim 19, wherein the silane comprises an isocyanatosilane or a methacryloxy silane.