**CLAIMS**

1. An actinic radiation and moisture dual curable composition which comprises:

(a) from about 10 to about 90 percent by weight of at least one alkoxysilane functional polyurethane acrylate oligomer having the formula (1) or (2):

$A\text{-}D\text{-}(P\text{-}D)_n\text{-}X$ (1)

$A\text{-}D\text{-}(P\text{-}D)_n\text{-}P\text{—}Y$ (2)

wherein:

i) D is a di- or tri-functional isocyanate group;

ii) P is a polyol group having a molecular weight of from about 50 Daltons to about 10000 Daltons;

iii) n is from 1 to about 100;

iv) A is a monoalcohol functional acrylate or methacrylate group;

v) X is a methoxysilane or ethoxysilane functional group containing a urea or thiourethane linkage;

vi) Y is a methoxysilane or ethoxysilane functional group containing a urethane linkage;

(b) from 0 to about 40 percent by weight of at least one alkoxysilane functional oligomer having the formula (3) or (4):

$Y\text{—}(PO\text{-}D)_m\text{-}PO\text{—}Y$ (3)
$X\text{-}D\text{-}(PO\text{-}D)_m\text{-}X$ (4)

wherein:

i) D is a di- or tri-functional isocyanate group;

ii) PO is a polyolefin group having a molecular weight of from about 300 Daltons to about 10000 Daltons;

iii) m is from 1 to about 100;

iv) X is a methoxysilane or ethoxysilane functional group containing a urea or thiourethane linkage;

v) Y is a methoxysilane or ethoxysilane functional group containing a urethane linkage;

(c) from 0 to about 40 percent by weight of at least one acrylate or methacrylate functional polyurethane acrylate oligomer having the formula (5);

$A\text{-}D\text{-}(P\text{-}D)_k\text{-}A$ (5)

wherein;

i) D is a di- or tri-functional isocyanate group;

ii) P is a polyol group having a molecular weight of from about 50 Daltons to about 10000 Daltons;

iii) k is from 1 to about 100;

iv) A is a monoalcohol functional acrylate or methacrylate group;

(d) from 0 to about 20 percent by weight of at least one hydroxyl terminated monoacrylate or monomethacrylate functional reactive diluent;

(e) from 1 to about 60 percent by weight of at least one free radical polymerizable reactive diluent;

(f) from about 0.1 to about 10 percent by weight of at least one free radical photoinitiator;

(g) from about 0.01 to about 3 percent by weight of at least one catalyst for moisture curing of silane groups;

(h) from 0 to about 3 percent by weight of a UV-absorber and hindered amine light stabilizer antioxidant;

(i) from 0 to about 15 percent by weight of a wax capable of reducing oxygen inhibition;

(j) from 0 to about 3 percent by weight of 1,3 dicarbonyl compound chelating agent;

(k) from 0 to about 10 percent by weight of a thixotropic agent;

(l) from 0 to about 10 percent by weight of an adhesion promoter.

2. The composition of claim 1 further comprising water.

3. The composition of claim 1 comprising the alkoxysilane functional polyurethane acrylate oligomer having the formula (1).

4. The composition of claim 1 comprising the alkoxysilane functional polyurethane acrylate oligomer having the formula (2).

5. The composition of claim 1 comprising both the alkoxysilane functional polyurethane acrylate oligomer having the formula (1) and the alkoxysilane functional polyurethane acrylate oligomer having the formula (2).

6. The composition of claim 1 wherein at least one of the following are present: at least one alkoxysilane functional oligomer having the formula (3) or (4); at least one acrylate or methacrylate functional polyurethane acrylate oligomer having the formula (5); at least one hydroxyl terminated monoacrylate or monomethacrylate functional reactive diluent; a UV-absorber and hindered amine light stabilizer antioxidant; a wax capable of reducing oxygen inhibition; 1,3 dicarbonyl compound chelating agent; a thixotropic agent; an adhesion promoter.

7. The composition of claim 1 wherein each of the following are present: at least one of at least one alkoxysilane functional oligomer having the formula (3) or (4); at least one acrylate or methacrylate functional polyurethane acrylate oligomer having the formula (5); at least one hydroxyl terminated monoacrylate or monomethacrylate functional reactive diluent; a UV-absorber and hindered amine light stabilizer antioxidant; a wax capable of reducing oxygen inhibition; 1,3 dicarbonyl compound chelating agent; a thixotropic agent; an adhesion promoter.

8. The composition of claim 1 which comprises:
component (a) in an amount of from about 20 to about 75 percent by weight;

component (b) in an amount of from 0 to about 30 percent by weight

component (c) in an amount of from 0 to about 30 percent by weight

component (d) in an amount of from 1 to about 20 percent by weight

component (e) in an amount of from 5 to about 40 percent by weight

component (f) in an amount of from about 0.5 to about 6 percent by weight;

component (g) in an amount of from about 0.05 to about 2 percent by weight;

component (h) in an amount of from 0.1 to about 2 percent by weight;

component (i) in an amount of from 0 to about 10 percent by weight;

component (j) in an amount of from 0 to about 2 percent by weight;

component (k) in an amount of from 0 to about 8 percent by weight;

component (l) in an amount of from 0 to about 5 percent by weight.

9. The composition of claim 1 which comprises:
component (a) in an amount of from about 30 to about 60 percent by weight;

component (b) in an amount of from 0 to about 20 percent by weight

component (c) in an amount of from 0 to about 20 percent by weight

component (d) in an amount of from 2 to about 15 percent by weight

component (e) in an amount of from 10 to about 30 percent by weight

component (f) in an amount of from about 1 to about 4 percent by weight;

component (g) in an amount of from about 0.1 to about 1 percent by weight;

component (h) in an amount of from 0.2 to about 1 percent by weight;

component (i) in an amount of from 0 to about 5 percent by weight;

component (j) in an amount of from 0 to about 1 percent by weight;

component (k) in an amount of from 0 to about 5 percent by weight;

component (l) in an amount of from 0 to about 3 percent by weight.

10. A method of curing an actinic radiation and moisture dual curable composition which comprises:
A) providing an actinic radiation and moisture dual curable composition which comprises:

(a) from about 10 to about 90 percent by weight of at least one alkoxysilane functional polyurethane acrylate oligomer having the formula (1) or (2):

$A\text{-}D\text{-}(P\text{-}D)_n\text{-}X$ (1)
$A\text{-}D\text{-}(P\text{-}D)_n\text{-}P\text{—}Y$ (2)

wherein:

i) D is a di- or tri-functional isocyanate group;

ii) P is a polyol group having a molecular weight of from about 50 Daltons to about 10000 Daltons;

iii) n is from 1 to about 100;

iv) A is a monoalcohol functional acrylate or methacrylate group;

v) X is a methoxysilane or ethoxysilane functional group containing a urea or thiourethane linkage;

vi) Y is a methoxysilane or ethoxysilane functional group containing a urethane linkage;

(b) from 0 to about 40 percent by weight of at least one alkoxysilane functional oligomer having the formula (3) or (4):

$Y\text{—}(PO\text{-}D)_m\text{-}PO\text{—}Y$ (3)

$X\text{-}D\text{-}(PO\text{-}D)_m\text{-}X$ (4)

wherein:

i) D is a di- or tri-functional isocyanate group;

ii) PO is a polyolefin group having a molecular weight of from about 300 Daltons to about 10000 Daltons;

iii) m is from 1 to about 100;

iv) X is a methoxysilane or ethoxysilane functional group containing a urea or thiourethane linkage;

v) Y is a methoxysilane or ethoxysilane functional group containing a urethane linkage;

(c) from 0 to about 40 percent by weight of at least one acrylate or methacrylate functional polyurethane acrylate oligomer having the formula (5);

$A\text{-}D\text{-}(P\text{-}D)_k\text{-}A$ (5)

wherein;

i) D is a di- or tri-functional isocyanate group;

ii) P is a polyol group having a molecular weight of from about 50 Daltons to about 10000 Daltons;

iii) k is from 1 to about 100;

iv) A is a monoalcohol functional acrylate or methacrylate group;

(d) from 0 to about 20 percent by weight of at least one hydroxyl terminated monoacrylate or monomethacrylate functional reactive diluent;

(e) from 1 to about 60 percent by weight of at least one free radical polymerizable reactive diluent;

(f) from about 0.1 to about 10 percent by weight of at least one free radical photoinitiator;

(g) from about 0.01 to about 3 percent by weight of at least one catalyst for moisture curing of silane groups;

(h) from 0 to about 3 percent by weight of a UV-absorber and hindered amine light stabilizer antioxidant;

(i) from 0 to about 15 percent by weight of a wax capable of reducing oxygen inhibition;

(j) from 0 to about 3 percent by weight of 1,3 dicarbonyl compound chelating agent;

(k) from 0 to about 10 percent by weight of a thixotropic agent;

(1) from 0 to about 10 percent by weight of an adhesion promoter; and

B) providing water to the composition; and

C) exposing the composition to sufficient actinic radiation to at least partially polymerize or crosslink the composition.

11. The method of claim 10 wherein water is provided to the composition by exposing the composition to water in an atmosphere surrounding the composition.

12. The method of claim 10 wherein water is provided to the composition by admixing water with the composition.

13. The method of claim 10 wherein the composition comprises the alkoxysilane functional polyurethane acrylate oligomer having the formula (1).

14. The method of claim 10 wherein the composition comprises the alkoxysilane functional polyurethane acrylate oligomer having the formula (2).

15. The method of claim 10 wherein the composition comprises both the alkoxysilane functional polyurethane acrylate oligomer having the formula (1) and the alkoxysilane functional polyurethane acrylate oligomer having the formula (2).

16. The method of claim 10 wherein the composition comprises at least one of the following: at least one alkoxysilane functional oligomer having the formula (3) or (4); at least one acrylate or methacrylate functional polyurethane acrylate oligomer having the formula (5); at least one hydroxyl terminated monoacrylate or monomethacrylate functional reactive diluent; a UV-absorber and hindered amine light stabilizer antioxidant; a wax capable of reducing oxygen inhibition; 1,3 dicarbonyl compound chelating agent; a thixotropic agent; an adhesion promoter.

17. The method of claim 10 wherein the composition comprises each of the following: at least one of at least one alkoxysilane functional oligomer having the formula (3) or (4); at least one acrylate or methacrylate functional polyurethane acrylate oligomer having the formula (5); at least one hydroxyl terminated monoacrylate or monomethacrylate functional reactive diluent; a UV-absorber and hindered amine light stabilizer antioxidant; a wax capable of reducing oxygen inhibition; 1,3 dicarbonyl compound chelating agent; a thixotropic agent; an adhesion promoter.

18. The method of claim 10 wherein the exposing is conducted by exposure to one or more of ultraviolet light, visible light, electron beam radiation, or combinations thereof.

19. The method of claim 10 wherein the exposing is conducted by exposure to one or more of ultraviolet light or visible light or combinations thereof in a range of from about 200 nm to about 500 nm range for from about 0.2 second to about 120 seconds, at an exposure intensity of from about 5 $mW/cm^2$ to about 2500 $mW/cm^2$.

20. The method of claim 10 wherein the exposing is conducted by exposure at a wavelength of from about 300 nm to about 465 nm.

21. The composition of claim 1 wherein from about 1 percent to about 20 percent by weight of at least one hydroxyl terminated monoacrylate or monomethacrylate functional reactive diluent component (d) is present in the composition.

22. The method of claim 10 wherein from about 1 percent to about 20 percent by weight of at least one hydroxyl terminated monoacrylate or monomethacrylate functional reactive diluent component (d) is present in the composition.