WHAT IS CLAIMED IS:

1. A composition for forming a crosslinked film that imparts anti-fog properties, the composition comprising:

at least one prepolymer comprising (a) one or more charged monomer residues; (b) one or more uncharged monomer residues; and (c) one or more amine reactive monomer residues; and

at least one amine bearing crosslinker,

wherein the crosslinked film has a change in haze value, as measured per ASTM D1003, of less than 30% when exposed to fog conditions for a period longer than 30 seconds.

2. The composition of claim 1, wherein the composition is a two-component system comprising:

a first component comprising at least one prepolymer; and

a second component comprising at least one amine bearing crosslinker,

wherein the first component and the second component are found in said composition in an amount sufficient to form an anti-fog film having a change in haze value, as measured per ASTM D1003, of less than 30% when exposed to fog conditions for a period longer than 30 seconds.

3. The composition of claim 2, wherein the composition comprises a molar ratio of the amine reactive monomer residues in the first component to the active hydrogens of the amines of the second component between 1 to 10 and 10 to 1.

4. The composition of claim 1, wherein the at least one prepolymer is composed of 0.01% to 30% by weight of charged monomer residues.

5. The composition of claim 1, wherein the at least one prepolymer is composed of 0.01% to 80% by weight of uncharged monomer residues.

6. The composition of claim 1, wherein the at least one prepolymer is composed of 0.01% to 30% by weight of amine reactive monomer residues.

7. The composition of claim 1, wherein the one or more charged monomer residues comprise sulfonate, carboxyl, phosphonate, nitro, imidazolium, guanidinium, or quaternary ammonium functional groups, or monomers that can be converted into those functional groups or combinations thereof,

wherein the one or more charged monomer residues comprising a sulfonate functional group comprise residues of 2-acrylamido-2-methylpropane sulfonic acid, 4-styrenesulfonate, vinyl sulfonic acid, 3-sulfopropyl acrylate, 3-sulfopropyl methacrylate, derivatives of these monomers, salts of these monomers, or combinations thereof, or

wherein the one or more charged monomer residues comprising a carboxyl functional group comprise residues of acrylic acid, methacrylic acid, 2-carboxyethyl acrylate, p-styrene carboxylic acid, 3-acrylamido-3-methylbutanoic acid, maleic anhydride, itaconic acid, alginate methacrylate, derivatives of these monomers, salts of these monomers, or combinations thereof, or

wherein the one or more charged monomer residues comprising a phosphonate functional group comprise residues of 11-phosphonoundecyl acrylate, vinylphosphonic acid, derivatives of these monomers, salts of these monomers, or combinations thereof, or

wherein the one or more charged monomer residues comprising an imidazolium functional group comprise residues of 1-allyl-3-methylimidazolium

chloride, 1-vinylimidazole, derivatives of these monomers, salts of these monomers, or combinations thereof, or

wherein the one or more charged monomer residues comprising a quaternary ammonium functional group comprise residues of [2-(methacryloyloxy)ethyl]dimethyl-(3-sulfopropyl)ammonium hydroxide, 2-ethyldimethylammonioethyl methacrylate, 2-(methacryloyloxy)ethyl] trimethylammonium, derivatives of these monomers, salts of these monomers, or combinations thereof.

8. The composition of claim 1, wherein the one or more, uncharged monomer residues are comprised of hydroxyl, pyrrolidone, acetate, or ether functional groups, or combinations thereof,

wherein the one or more uncharged monomer residues comprised of hydroxyl functional groups comprise residues of 2-hydroxyethyl methacrylate, hydroxypropyl methacrylate, N-(2-hydroxyethyl) methacrylamide, vinyl alcohol, the acrylate or methacrylate of a carbohydrate, derivatives of these monomers, or combinations thereof, or

wherein the one or more uncharged monomer residues comprised of pyrrolidone functional groups comprise residues of n-vinyl-2-pyrrolidone, or derivatives of this monomer, or

wherein the one or more uncharged monomer residues comprised of acetate functional groups comprise residues of vinyl acetate, derivatives of these monomers, or combinations thereof, or

wherein the one or more uncharged monomer residues comprised of ether functional groups comprise residues of tetrahydrofurfuryl acrylate or methacrylate, any acrylate or methacrylate-based monomer with a polyethylene glycol or

polypropylene glycol functionality, 2-ethoxyethyl methacrylate, diethylene glycol butyl ether methacrylate, derivatives of these monomers, or combinations thereof.

9. The composition of claim 1, wherein the one or more amine reactive monomer residues are comprised of epoxy, ketone, anhydride, alkene, or isocyanate functional groups, or combinations thereof,

wherein the one or more amine reactive monomer residues comprised of epoxy functional groups comprise residues of glycidyl methacrylate, 3, 4-epoxycyclohexylmethyl methacrylate, allyl glycidyl ether, 4-vinyl-1-cyclohexene 1,2-epoxide, derivatives of these monomers, or combinations thereof, or

wherein the one or more amine reactive monomer residues comprised of ketone functional groups comprise residues of methyl vinyl ketone, diacetone acrylamide, derivatives of these monomers, or combinations thereof, or

wherein the one or more amine reactive monomer residues comprised of anhydride functional groups comprise residues of n-hydroxy succinimide bearing monomers, maleic anhydride, derivatives of these monomers, or combinations thereof, or

wherein the one or more amine reactive monomer residues comprised of alkene functional groups comprise residues of allyl methacrylate, vinyl methacrylate, derivatives of these monomers, or combinations thereof, or

wherein the one or more amine reactive monomer residues comprised of isocyanate functional groups comprise residues of 2-isocyanatoethyl methacrylate or derivatives thereof.

10. The composition of claim 1, wherein the amine bearing crosslinker comprises primary amines or secondary amines, or secondary amino silanes, or combinations thereof, or

wherein the amine bearing crosslinker comprises polyether amine, or a polymer with a polyether backbone comprising polyethylene oxide, polypropylene oxide, or other ethylene oxides that contains 1 or more nitrogen atoms per molecule, polyoxypropylenediamine, polyoxypropylenetriamine, O,O′-bis(2-aminopropyl) polypropylene glycol-block-polyethylene glycol-block-polypropylene glycol, n-butylaminopropyltrimethoxysilane, n-methylaminopropyltrimethoxysilane, bis(3-trimethoxysilylpropyl) amine, imidizoles, dicyandiamide, or combinations thereof.

11. The composition of claim 2, wherein the first component further comprises a carrier solvent comprising 20%-100% by weight of water, and 0%-80% by weight of one or more water miscible cosolvents, wherein the water miscible cosolvents comprise methanol, ethanol, isopropanol, 1-methoxy 2-propanol, acetone, methyl ethyl ketone, ethyl acetate, butanol, ethylene glycol, propylene glycol, glycerol or combinations thereof.

12. The composition of claim 2, wherein the second component further comprises a carrier solvent, wherein the carrier solvent comprises water, water miscible solvents comprising methanol, ethanol, isopropanol, 1-methoxy 2-propanol, acetone, methyl ethyl ketone, ethyl acetate, butanol, ethylene glycol, propylene glycol, glycerol or combinations thereof.

13. The composition of claim 1, further comprising one or more additives comprising a mechanical additive, a dispersant, a coupling agent, a UV absorber, a UV stabilizer, a surfactant or leveling additive, a curing catalyst, anti-freeze additives, dyes, or biocides.

14. The composition of claim 13, wherein the one or more additives are found in the composition in a concentration greater than 0.0001% and less than 40% by weight.

15. The composition of claim 13, wherein the mechanical additive comprises one or more of silica nanoparticles, alumina nanoparticles, zinc nanoparticles, ceria nanoparticles, titania nanoparticles, cellulose nanofibers, polyhedral oligomeric silsesquioxanes (POSS) materials, silsesquioxane materials, silicone materials, fumed silica, polyamide particles, phyllosilicate particles, montmorillonite particles, boehmite particles, epoxy-bearing reactive dilutants, waxes, or any combinations thereof.

16. The composition of claim 13, wherein the coupling agent comprises a molecule with a silane functional group and one or more epoxy, amine, thiol, anhydride, or isocyanate functional groups or combinations thereof, or

wherein the coupling agent comprises one or more of (3-aminopropyl)triethoxysilane, 2-(3,4-epoxycyclohexyl)ethyltriethoxysilane, (3-glycidoxypropyl)trimethoxysilane, 2-(3,4-epoxycyclohexyl)ethyltrimethoxysilane, (3-glycidoxypropyl)triethoxysilane, n-(2-aminoethyl)-3-aminopropyltrimethoxysilane, 3-mercaptopropyltrimethoxysilane, isocyanatopropyltriethoxysilane, n-methylaminopropyltrimethoxysilane, n-butylaminopropyltrimethoxysilane, bis(3-trimethoxysilylpropyl)amine, (3-triethoxysilyl)propylsuccinic anhydride, or combinations thereof.

17. The composition of claim 13, wherein the UV absorber comprises one or more of benzophenones, benzotriazoles, cyanoacrylates, hydroxyphenyl triazines, zinc nanoparticles, ceria nanoparticles, titania nanoparticles, or any combinations thereof.

18. The composition of claim 13, wherein the UV stabilizer comprises one or more hindered amine light stabilizer (HALS) agents, or

wherein the UV stabilizer comprises 2 bis (2,2,6,6-tetramethyl-4-piperidyl) sebacate, decanedioic acid, 1−methyl 10−(1,2,2,6,6−pentamethyl−4−piperidinyl), decanedioic acid, 1,10−bis(1,2,2,6,6−pentamethyl−4−piperidinyl)ester, dimethyl succinate polymer with 4-hydroxy-2,2,6,6-tetramethyl-1-piperidine ethanol, poly[[6-[(1,1,3,3,-tetramethylbutyl)amino -s-triazine-2,4-diyl] [2,2,6,6-tetramethyl-4-piperidyl)imino]]hexamethylene[(2,2,6,6-tetramethyl-4-piperidyl)imino]], or combinations thereof.

19. The composition of claim 13, wherein the surfactant or leveling agent comprises silicon polyether surfactants, polyethylene glycol p-(1,1,3,3-tetramethylbutyl)-phenyl ether, polysorbate based surfactants, sodium dodecyl sulfate, cetyltrimethylammonium bromide surfactants, dispersants, styrene-maleic acid copolymers, polyacrylates modified with silicones, polyethylene-polypropylene block copolymer surfactants, or combinations thereof.

20. The composition of claim 13, wherein the composition further comprises a catalytic acid or base.

21. The composition of claim 13, wherein the anti-freeze additive comprises glycerol, ethylene glycol, propylene glycol, polypropylene glycol, or polyethylene glycol, or a molecule comprising at least one of the foregoing.

22. The composition of claim 2 wherein the first composition and the second composition are found in an amount sufficient to have a pot life greater than 8 hours, wherein the pot life is quantified as the amount of time it takes for the composition’s initial viscosity to quadruple at room temperature.

23. The composition of claim 2, wherein the first component and the second component are found in an amount sufficient to form a hydrophilic film that cures within 48 hours at 25 °C and 0%-50% relative humidity.

24. The composition of claim 2, wherein the first component and the second component are found in an amount sufficient to form a hydrophilic film that is dry to the touch after heating for 5 minutes at 130 °C.

25. An anti-fog film comprising a crosslinked polymer, said crosslinked polymer comprising the composition of any one of claims 1-24.

26. A coated article comprising a substrate and a coating, said coating comprising the composition of any one of claims 1-24.

27. A method of making a surface of a substrate resistant to fogging, said method comprising:

applying to the surface of the substrate a compound comprising the composition of any one of claims 1-24.