Summary

[0007a] In one aspect of the present disclosure, there is provided an elastomeric article having a coating thereon, the coating comprising:

a water-based hydrogel polymer; and

at least one elastomeric material added to the water-based hydrogel polymer to form a coating formulation;

wherein the coating formulation does not contain any added solvents.

[0007b] In another aspect of the present disclosure, there is provided a method of coating an elastomeric article, comprising:

dipping an elastomeric article in an aqueous coating composition to obtain a coated article, the coating composition comprising a water-based hydrogel and at least one elastomeric material;

curing the coated article;

drying the coated article; and

wherein the elastomeric article is dipped into the coating solution in the absence of a solvent; and

wherein the elastomeric article does not require a chemical priming step prior to dipping into the coating composition.

[0007c] In yet another aspect of the present disclosure, there is provided an elastomeric article having a coating thereon, the coating comprising:

a water-based hydrogel polymer;

a natural rubber latex; and

a nitrile latex, blended together to form a coating composition;

wherein the coating formulation does not contain any added solvents.

[0007d] In a further aspect of the present disclosure, there is provided a method of coating an elastomeric article using the coating as defined herein.

[0007e] In another aspect of the present disclosure, there is provided an elastomeric article having a coating thereon, the coating comprising:

a water-based hydrogel polymer;

a polyisoprene; and

a nitrile latex, blended together to form a coating composition;

wherein the coating formulation does not contain any added solvents.

[0007f] In yet another aspect of the present disclosure, there is provided a coating composition for coating an elastomeric article comprising:

a water-based hydrogel polymer; and

a first elastomeric material selected from the group consisting of a natural rubber latex and a polyisoprene latex and a second elastomeric material added to the water-based hydrogel polymer to form a coating formulation;

wherein the coating formulation does not contain any added solvents,

wherein the second elastomeric material is a nitrile latex,

wherein the elastomeric article comprises a material that is the same as the first elastomeric material, and

wherein the water-based hydrogel polymer is present in an amount of about 50% to about 99% by weight of the coating formulation.

[0008] A water-based hydrogel coating is provided that facilitates improved lubricity of an elastomeric article coated with the water-based hydrogel coating and, in the case of a glove, improved donning. In particular, a water-based hydrogel blend coating solution is provided that comprises a water-based hydrogel and at least one elastomeric material without requiring a solvent medium. In addition, a method of applying the water-based hydrogel blend coating composition to elastomeric articles is provided having an improved process that does not require an acid priming or other chemical priming step. In one embodiment, the hydrogel blend coating composition can be provided such that at least one of the elastomeric components of the hydrogel blend solution is the same as or similar to the elastomeric material of the final elastomeric article.

[0009] A water-based hydrogel coating can be formed by combining a water-based hydrogel with one or more elastomeric materials and, in the present disclosure, with a blend of two or more elastomeric materials to form a water-based hydrogel blend coating. In the present disclosure, the elastomeric blend can comprise two or more elastomeric materials and, in one instance can comprise nitrile rubber and another elastomer similar to the base article material. This water-based hydrogel blend can be applied to either natural or synthetic rubber latex materials to result in a final article that is coated on at least one surface with the hydrogel blend coating. The final article that is coated can be any elastomeric article that can benefit from an improved lubricity and, in the present disclosure,

can include, but is not limited to, medical gloves, surgical gloves, examination gloves, industrial gloves, condoms, finger cots, probe covers, catheters, ureters, and the like.

[0010] The blended formulation allows for a coating solution having a higher solids content, which is beneficial in improving the lubricity of the final elastomeric article, and that remains adhered to the article despite having high solids content. In contrast, a non-blended formulation cannot retain coating adherence at similarly high solids content, thus, being unable to coat at a high solids content onto an elastomeric

What is Claimed is:

1. An elastomeric article having a coating thereon, the coating comprising:

a water-based hydrogel polymer; and

at least one elastomeric material added to the water-based hydrogel polymer to form a coating formulation;

wherein the coating formulation does not contain any added solvents.

2. The elastomeric article of claim 1, wherein the elastomeric material is selected from the group consisting of natural rubber latex, polyisoprene, polychloroprene, polyurethane, polybutadiene, nitrile, block copolymers of styrene and butadiene, block copolymers of styrene and isoprene.

3. The elastomeric article of claim 2, wherein the elastomeric material is natural rubber.

4. The elastomeric article of claim 2, wherein the elastomeric material is polyisoprene.

5. The elastomeric article of any preceding claim, wherein the elastomeric material is a blend of at least two elastomeric materials.

6. The elastomeric article of any preceding claim, wherein the at least one elastomeric material in the coating formulation is the same as the elastomeric article.

7. The elastomeric article of any preceding claim, wherein the water-based hydrogel is present in an amount of 50% to 90% by weight in the coating formulation.

8. The elastomeric article of any preceding claim, wherein the coating formulation further comprises a surfactant.

9. The elastomeric article of any preceding claim, wherein the coating formulation further comprises a biocide.

10. The elastomeric article of any preceding claim, wherein the hydrogel is present in an amount of about 75% by weight of the coating formulation.

11. The elastomeric article of claim 7, wherein the hydrogel is present in an amount from 75% to 85%.

12. The elastomeric article of claim 11, wherein the hydrogel is present in an amount of about 85%.

13. The elastomeric article of any preceding claim, wherein the at least one elastomeric material is present in a range of 0.5% to 37% by weight of the coating formulation.

14. The elastomeric article of claim 5, wherein a second elastomeric material is present in the coating formulation in a range of 0.5% to 25% by weight.

15. The elastomeric article of claim 13, wherein the at least one elastomeric material is present in the range of 6% to 19% by weight of the coating formulation.

16. The elastomeric article of claim 14, wherein the second elastomeric material is present in the range of 6% to 19% by weight of the coating formulation.

17. The elastomeric article of any of the preceding claims, wherein the at least one elastomeric material is present in about 19% by weight of the coating formulation.

18. The elastomeric article of claim 16, wherein the second elastomeric material is present in about 6% by weight of the coating formulation.

19. The elastomeric article of any of the preceding claims, wherein the at least one elastomeric material is natural rubber.

20. The elastomeric article of any one of claims 5, 14, 16, and 18, wherein the second elastomeric material is nitrile.

21. The elastomeric article of claim 11, wherein the at least one elastomeric material is present in a range of 4% to 11% by weight of the coating formulation.

22. The elastomeric article of claim 21, wherein the second elastomeric material is present in the range of 4% to 11% by weight of the coating formulation.

23. The elastomeric article of claim 21, wherein the at least one elastomeric material and the second elastomeric material is each present in about 7.5% by weight of the coating formulation.

24. The elastomeric article of claim 23, wherein the at least one elastomeric material is polyisoprene and the second elastomeric material is nitrile.

25. The elastomeric article of any of the preceding claims, wherein the article has an average coating flaking rating of about 1 at an average TSC of 3.5.

26. The elastomeric article of claim 1, wherein the article has a wet Coefficient of Friction (COF) of less than 0.10 at 7% TSC.

27. The elastomeric article of claim of any of the preceding claims, wherein the article has a wet Coefficient of Friction (COF) of less than 0.10 at 4% TSC.

28. The elastomeric article of any of the preceding claims, wherein the article has less than 1 mg of powder in the residual powder content test.

29. The elastomeric article of any of the preceding claims, wherein the article is powder free.

30. A method of coating an elastomeric article, comprising:

dipping an elastomeric article in an aqueous coating composition to obtain a coated article, the coating composition comprising a water-based hydrogel and at least one elastomeric material;

curing the coated article;

drying the coated article; and

wherein the elastomeric article is dipped into the coating solution in the absence of a solvent; and

wherein the elastomeric article does not require a chemical priming step prior to dipping into the coating composition.

31. The method according to claim 30, wherein the at least one elastomeric material is the same material as the elastomeric article.

32. The method according to claim 29 or 30, wherein a second elastomeric material different from the at least one elastomeric material is added to the coating composition.

33. The method of any one of claims 30-32, further including the step of chlorinating the coated article.

34. The method of any one of claims 30-33, further including the step of spraying the coated article with a lubricant solution.

35. An elastomeric article having a coating thereon, the coating comprising:

a water-based hydrogel polymer;

a natural rubber latex; and

a nitrile latex, blended together to form a coating composition;

wherein the coating formulation does not contain any added solvents.

36. The elastomeric article of claim 35, wherein the water-based hydrogel polymer is present at about 75% by weight of the coating composition and the combination of the natural rubber latex and nitrile latex together comprise about 25% by weight of the coating composition.

37. A method of coating an elastomeric article using the coating of claim 35 or 36.

38. An elastomeric article having a coating thereon, the coating comprising:

a water-based hydrogel polymer;

a polyisoprene; and

a nitrile latex, blended together to form a coating composition;

wherein the coating formulation does not contain any added solvents.

39. The elastomeric article of claim 38, wherein the water-based hydrogel polymer is present at about 85% by weight of the coating composition and the combination of the polyisoprene latex and nitrile latex together comprise about 15% by weight of the coating composition.

40. A coating composition for coating an elastomeric article comprising:

a water-based hydrogel polymer; and

a first elastomeric material selected from the group consisting of a natural rubber latex and a polyisoprene latex and a second elastomeric material added to the water-based hydrogel polymer to form a coating formulation;

wherein the coating formulation does not contain any added solvents,

wherein the second elastomeric material is a nitrile latex,

wherein the elastomeric article comprises a material that is the same as the first elastomeric material, and

wherein the water-based hydrogel polymer is present in an amount of about 50% to about 99% by weight of the coating formulation.

41. The coating composition of claim 40, wherein the water-based hydrogel is present in an amount of 50% to 90% by weight in the coating formulation.

42. The coating composition of claim 40 or 41, wherein the coating formulation further comprises a surfactant.

43. The coating composition of any one of claims 40-42, wherein the coating formulation further comprises a biocide.

44. The coating composition of claim 40, wherein the water-based hydrogel polymer is present in an amount of about 75% by weight of the coating formulation.

45. The coating composition of claim 40, wherein the water-based hydrogel polymer is present in an amount from 75% to 85% of the coating formulation.

46. The coating composition of claim 45, wherein the first elastomeric material is present in a range of 0.5% to 37% by weight of the coating formulation.

47. The coating composition of claim 40, wherein a second elastomeric material is present in the coating formulation in a range of 0.5% to 25% by weight of the coating formulation.

48. The coating composition of claim 47, wherein the first elastomeric material is present in the range of 6% to 19% by weight of the coating formulation.

49. The coating composition of claim 47, wherein the second elastomeric material is present in the range of 6% to 19% by weight of the coating formulation.

50. The coating composition of claim 48, wherein the first elastomeric material is present in about 19% by weight of the coating formulation.

51. The coating composition of claim 49, wherein the second elastomeric material is present in about 6% by weight of the coating formulation.

52. The coating composition of any one of claims 40-51, wherein the first elastomeric material is the natural rubber latex.

53. The coating composition of claim 40, wherein the first elastomeric material is present in a range of 4% to 11% by weight of the coating formulation.

54. The coating composition of claim 40, wherein the second elastomeric material is present in the range of 4% to 11% by weight of the coating formulation.

55. The coating composition of claim 53, wherein the first elastomeric material and the second elastomeric material is each present in about 7.5% by weight of the coating formulation.

56. The coating composition of claim 40, wherein the first elastomeric material is the polyisoprene latex.

57. The coating composition of claim 40, wherein the coating composition has less than 0.10 percent coagulum after 3 days in the Mechanical Stability Test (MST) test.