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.

[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.

[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

at least one elastomeric material added to the water-based hydrogel polymer;

wherein the coating formulation does not contain any added solvents.

[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

article. Higher solids content allows for more coating to be applied per surface area of the glove, which in turn provides an increased lubricity. The final coated elastomeric article, coated with the water-based hydrogel blend disclosed herein, can have an improved lubricity than an article coated with the hydrogel alone and can further facilitate both improved donning of an elastomeric glove article, for example, when the skin is damp (e.g., wet donning) and donning when the skin is dry (e.g., dry donning).

[0011] A method of applying the water-based hydrogel blend coating to an elastomeric article can reduce the number of process steps required as compared to previous solvent-based coating processes. In particular, an acid or other chemical priming step prior to application of the hydrogel blend coating is not required. In the present disclosure, an elastomeric glove material can be coated in a process with the hydrogel blend coating disclosed herein. The glove material can be made by conventional glove forming processes, such as coagulant dipping. After a glove former is dipped into the latex material, it can be dried and dipped again into the hydrogel blend coating, without requiring an acid priming step or other chemical priming step. In the present disclosure, gloves can be provided with the coating material for improved wet and dry donning of the glove and further provided with a textured surface for improved grippability of the glove while in use.

[0012] The water-based hydrogel blend is advantageous because it is solvent-free, which can avoid some of the flammability issues associated with using a solvent-based hydrogel in a manufacturing facility. In addition, there is less material waste and disposal due to the water-based formulation compared to the solvent-based formulation, making the water-based formulation more environmentally friendly. The solvent-based formulation requires disposal of the hazardous solvent material which adds cost, processing time and is not friendly to the environment. Moreover, the shelf-life of the water-based hydrogel blend is increased compared to the solvent-based hydrogel system such that the water-based hydrogel blend formulation can be stored for a longer period of time prior to use.

[0013] It is further advantageous to coat an elastomeric article with the water-based hydrogel blend in comparison to coating with only the hydrogel coating alone. The hydrogel blend mixture has improved mechanical and thermal stability compared

to the hydrogel coating mixture alone. In addition, the hydrogel blend has superior adhesion to the elastomeric substrate compared to the hydrogel coating alone. Application of the hydrogel only to the elastomeric article as the coating can pose some technical challenges. One of the challenges is that a hydrogel only coating on an elastomeric article can delaminate from the elastomeric article substrate. To overcome the issue of delamination, the surface of the elastomeric article can be primed with harsh chemicals; however, this can cause the deterioration of physical properties of the elastomeric article itself. Another approach to overcome delamination can be to coat the elastomeric article with a low total solid of the coating solution; however, a low total solid can reduce the coating performance which in turn can result in a poor dry or wet lubricity. Another approach can be to modify the hydrogel only material by inclusion of polymer lattices.

[0014] In the present disclosure, an elastomeric glove can be formed and then coated with the water-based hydrogel blend disclosed herein. The glove, in one embodiment, can be formed from natural rubber latex and then dipped into the hydrogel blend comprising the hydrogel, natural rubber and a second elastomeric article, such as nitrile latex. The amount of natural rubber in the blend can be greater than the amount of nitrile latex in the blend. In the present disclosure, the amount of natural rubber latex can be the same as the nitrile latex in the blend. In the present disclosure, the amount of nitrile in the blend can be greater than the natural rubber.

[0015] In another embodiment, the glove can be formed from a synthetic rubber latex and then coated in a hydrogel blend comprising the hydrogel, synthetic rubber and a second elastomeric article. The glove, in one embodiment, can be formed from synthetic rubber latex and then dipped into the hydrogel blend comprising the hydrogel, synthetic rubber and a second elastomeric article, such as nitrile latex. The amount of synthetic rubber in the blend can be greater than the amount of nitrile latex in the blend. In the present disclosure, the amount of synthetic rubber latex can be the same as the nitrile latex in the blend. In the present disclosure, the amount of nitrile in the blend can be greater than the synthetic rubber. In a preferred embodiment, the synthetic rubber of the article and the blend is polyisoprene. In yet another embodiment, at