CLAIMS

1. A process for producing an optically transparent, peroxide cured article made from a peroxide curable butyl rubber ionomer, the process comprising:

admixing:

a halogenated butyl rubber polymer comprising repeating units derived from at least one isoolefin monomer, repeating units derived from one or more multiolefin monomers, and at least an allylic halogen moiety;

a nitrogen or phosphorous based nucleophile comprising a pendant vinyl group; and

a peroxide curing agent to produce a curable mixture;

disposing the curable mixture on a heated surface having an RMS surface roughness of less than 10 nm; and

curing the mixture under conditions sufficient for curing the mixture with the peroxide curing agent to produce a cured article.

2. The process according to claim 1, further comprising:

first admixing the nucleophile with the polymer at a temperature of 25 to 100°C. to react the allylic halogen moiety with the nucleophile to produce a peroxide curable butyl rubber ionomer; and,

subsequently admixing the peroxide curing agent with the peroxide curable butyl rubber ionomer to produce the curable mixture.

3. The process according to claim 1, wherein:

the heated surface comprises two heated surfaces having an RMS roughness of 0.1 to 10, and the process comprises disposing the curable mixture between the heated surfaces; and

the nucleophile is admixed with the polymer at a temperature of 25 to 60°C.

4. The process according to claim 1, wherein the process comprises substantially simultaneously admixing the peroxide curing agent with the halogenated butyl rubber polymer and the nucleophile and then simultaneously reacting the peroxide curing agent with the halogenated butyl rubber polymer and/or the nucleophile.

5. The process according to claim 1, wherein the peroxide curing agent comprises at least one of dicumyl peroxide, di-tert-butyl peroxide, benzoyl peroxide, 2,2'-bis (tert.-

butylperoxy) diisopropylbenzene, benzoyl peroxide, 2,5-dimethyl-2,5-di(tert-butylperoxy)-hexyne-3, 2,5-dimethyl-2,5-di(benzolyperoxy)hexane, and 2,5-bis(tert-butylperoxy)-2,5-dimethyl hexane.

6. The process according to claim 1, further comprising adding 0.7 to 7 phr of the peroxide curing agent.

7. The process according to claim 2, further comprising admixing a peroxide curing co-agent with the peroxide curing agent and the ionomer, wherein the co-agent comprises at least one of triallyl isocyanurate (TAlC), N,N'-m-phenylene dimaleimide, triallyl cyanurate (TAC) and liquid polybutadiene.

8. The process according to claim 1, wherein the ionomer is unsaturated and an amount of unsaturation comprises a sum total of the unsaturation of the butyl rubber and the unsaturation of the pendant vinyl group, and the amount of unsaturation is greater than or equal to 1.0 mol %.

9. The process according to claim 1, further comprising coating the heated surface with a release layer, wherein the release layer comprises at least one of poly(dimethylsiloxane) (PDMS), silicone rubber polymer, and a fluoropolymer.

10. The process according to claim 1, wherein the curing comprises curing the mixture at a temperature of 100 to 200°C. for a curing time o f 1 to 30 minutes.

11. The process according to claim 10, wherein the curing temperature is 160-175°C.

12. The process according to claim 1, wherein

disposing the curable mixture comprising disposing the curable mixture between two heated surfaces, each having en RMS surface roughness of less than 10 nm, and

curing the mixture produces the cured article between the two heated surfaces, and the method further comprises releasing the article from between the heated surfaces at a release temperature of less than or equal to 100°C .

13. The process according to claim 1, wherein the release temperature is greater than or equal to 30°C.

14. The process according to claim 1, wherein the RMS surface roughness of the cured article is less than 7 nm.

15. The process according to claim 1, wherein the article has a thickness and at least a portion of the article exhibits an optical transparency of at least 75% to a wavelength of 630 nm at a thickness of less than or equal to 0.51 mm.