COMPOSITION FOR MARKINGS

FIELD OF THE INVENTION

[0001] The present invention generally relates to compositions that are useful as markings, such as pavement markings.

BACKGROUND OF THE INVENTION

[0002] Pavement markings are part of a communication system for road users. In addition to signs and signals, pavement markings communicate to drivers where to position their vehicles, warn about upcoming conditions, and indicate where passing is allowed. Therefore, clear road markings are essential for safe driving, particularly during rainy conditions.

[0003] Pavement markings (e.g., paints, tapes, and individually mounted articles) guide and direct motorists and pedestrians traveling along roadways and paths. Paint was a preferred pavement marking for many years. However, modern liquid pavement marking materials offer significant advantages over paint, such as increased visibility, retroreflectance, improved durability, and temporary and/or removable marking options.

[0004] Conventional pavement markings may display decreased brightness over time due to exposure to dirt and the environment. Pavement markings are subject to continuous wear and exposure to the elements as well as road chemicals. One common problem with conventional pavement marking systems is their inability to stay white on the road. An associated danger is that a dirty pavement marking can become ineffective during daylight.

[0005] There is a therefore a need to provide a composition that overcomes, or at least ameliorates, one or more of the disadvantages described above.

SUMMARY

[0006] There is provided a composition comprising a thermoplastic binder, at least one optical component, and a colour correcting component, said colour correcting component being selected to selectively absorb a wavelength of light.

[0006a] In a first aspect of the present disclosure, there is provided a composition comprising

a thermoplastic binder ~~and~~ comprising a C5 hydrocarbon resin present in an amount of 10 to 30 wt%,

at least one optical component comprising retroreflective particles selected from the group consisting of transparent glass beads and microcrystalline ceramic beads,

wherein the transparent glass beads are present in an amount of 5 to 30 wt% and the microcrystalline ceramic beads are present in the amount of 1 to 15 wt%,

a whitening agent comprising TiO_2 present in an amount of 1 to 15 wt%,

at least one filler comprising calcium carbonate present in an amount of 30 to 70 wt%,

and a colour correcting component present in an amount less than 5 wt% comprising at least one pigment,

said colour correcting component being selected to selectively absorb a wavelength of light, wherein the thermoplastic binder and at least one optical component has a first colour and the colour correcting component has a second colour, wherein said first colour and said second colour are a complementary colour pair, thus giving the composition a desired colour.

[0007] Advantageously, the disclosed compositions may display a high luminance coefficient which persists even after a period of exposure.

Claims

1. A composition comprising

a thermoplastic binder ~~and~~ comprising a C5 hydrocarbon resin present in an amount of 10 to 30 wt%,

at least one optical component comprising retroreflective particles selected from the group consisting of transparent glass beads and microcrystalline ceramic beads,

wherein the transparent glass beads are present in an amount of 5 to 30 wt% and the microcrystalline ceramic beads are present in the amount of 1 to 15 wt%,

a whitening agent comprising TiO_2 present in an amount of 1 to 15 wt%,

at least one filler comprising calcium carbonate present in an amount of 30 to 70 wt%, and

a colour correcting component present in an amount less than 5 wt% comprising at least one pigment, said colour correcting component being selected to selectively absorb a wavelength of light,

wherein the thermoplastic binder and at least one optical component has a first colour and the colour correcting component has a second colour, wherein said first colour and said second colour are a complementary colour pair, thus giving the composition a desired colour.

2. The composition according to claim 1, wherein the colour correcting component absorbs light in a range of (i) 540 to 600 nm, or (ii) 480 to 540 nm, or (iii) 445 to 505 nm.

3. The composition according to claim 1, wherein the complementary colour pair is selected from the group consisting of a yellow and violet pair, a green and red pair, and a blue and orange pair.

4. The composition according to any one of the preceding claims, wherein the colour correcting component comprises at least one pigment selected from a group consisting of a aluminosilicate-based pigment, cyanine-based pigment, a polymethine-based pigment, a squarylium-based pigment, a phthalocyanine-based pigment, a quinone-based pigment, an azaporphyrin-based pigment, an azo-based pigment, an azochelate-based pigment, an azlenium-based pigment, a pirillum-based pigment, a croconium-based pigment, an indoaniline chelate-based pigment, an indonaphthol chelate-based

pigment, a dithiol metal complex-based pigment, a pyrromethene-based pigment, an azomethine-based pigment, a xanthene-based pigment, and an oxonol-based pigment.

5. The composition according to any one of the preceding claims, wherein the colour correcting component comprises a pigment selected from the group consisting of UltraMarine Blue, Prussian Blue and Indigo.

~~6. The composition according to any one of the preceding claims, wherein said composition comprises less than 5 wt% of colour correcting component.~~

~~7. The composition according to any one of the preceding claims, wherein the thermoplastic binder is present in an amount of 10 to 30 wt%.~~

~~8~~6. The composition according to any one of the preceding claims, wherein the thermoplastic binder ~~is selected from the group consisting of C5 hydrocarbon resin,~~further comprises a resin comprising rosin acids, a resin comprising rosin esters, a resin comprising modified rosin acids, a resin comprising modified rosin esters, and mixtures thereof.

~~9. The composition according to any one of the preceding claims, wherein the optical components are present in an amount of 5 to 50 wt%.~~

~~10. The composition according to claim 9, wherein the retroreflective particles are selected from the group consisting of transparent glass beads and microcrystalline ceramic beads.~~

~~11. The composition according to any of the preceding claims further comprising a whitening agent.~~

~~12. The composition according to claim 11, wherein the whitening agentis present in an amount in the range of 1 to 15 wt%.~~

~~13. The composition according to any one of claims 11 to 12, wherein the whitening agent comprises titanium dioxide.~~

~~14. The composition according to any of the preceding claims further comprising at least one filler.~~

~~15. The composition according to claim 14, wherein the filler(s) is present in an amount in the range of 30 to 70 wt%.~~

~~16. The composition according to any one of claims 14 to 15, wherein the filler comprises calcium carbonate particles.~~

~~17~~7. The composition according to ~~claim 16~~any of the preceding claims, wherein the calcium carbonate particles are present in a first size and a second size, wherein the first and second sizes are different.

~~18~~8. The composition according to claim ~~17~~7, wherein the first size is in the range of 40 to 200 μm, and the second size is in the range of 1 to 40 μm.

~~19~~9. The composition according to any of the preceding claims further comprising a plasticizer.

~~20~~10. The composition according to any of the preceding claims further comprising a wax.

~~21~~11. The composition according to claim ~~20~~ 10, wherein the wax is a polyethylene or polypropylene wax.

~~22~~12. The composition according to any of the preceding claims further comprising a viscosity modifier.

~~23. The composition according to any one of the preceding claims, wherein the composition comprises:~~

~~(a) a C5 hydrocarbon resin;~~

~~(b) at least one whitening agent;~~

~~(c) at least one optical component;~~

~~(d) a colour correcting component; and~~

~~(e) at least one filler.~~

~~24. The composition according to any of the preceding claims, wherein the composition comprises:~~

~~(a) a C5 hydrocarbon resin present in an amount of 10 to 30 wt%;~~

~~(b) whitening agent present in an amount of 1 to 15 wt%;~~

~~(c) optical component(s) present in an amount of 5 to 50 wt%;~~

~~(d) a colour correcting component present in an amount less than 5 wt%; and~~

~~(e) filler(s) present in an amount of 30 to 70 wt%.~~

~~25. The composition according to according to any of the preceding claims, wherein the composition comprises:~~

~~(a) a C5 hydrocarbon resin present in an amount of 10 to 30 wt%;~~

~~(b) TiO_2 present in an amount of 1 to 15 wt%;~~

~~(c) Transparent glass beads and/or microcrystalline ceramic beads present in an amount of 5 to 50 wt%;~~

~~(d) a colour correcting component present in an amount less than 5 wt%; and~~

~~(e) Calcium carbonate present in an amount of 30 to 70 wt%.~~

~~26. The composition according to claim 25, wherein the transparent glass beads are present in an amount of 5 to 30 wt% and the microcrystalline ceramic beads are present in the amount of 1 to 15 wt%.~~

~~27~~13. A pavement marking comprising a composition according to any one of the preceding claims.

~~28~~14. A traffic bearing surface having thereon a pavement marking comprising the composition of any of the preceding claims.

~~29~~15. A pre-formed pavement marking comprising a substrate having thereon a coating of the composition of any of the preceding claims.

~~30~~16. A profiled audible pavement marking comprising a substrate having thereon a coating of the composition of any of the preceding claims.

~~31~~17. The pavement marking, pre-formed pavement marking or profiled audible pavement marking according to any one of claims ~~27–~~13 to ~~30~~16, wherein the composition ~~comprises~~ is heated to form a mixture ~~comprising a thermoplastic binder and a colour correcting component and at least one optical component~~.

~~32~~18. A method of forming the pavement marking, pre-formed pavement marking or profiled audible pavement marking according to claim ~~31~~17, wherein the optical component(s) are dropped onto the surface of the mixture after the mixture has been applied to said the pavement, traffic bearing surface, pre-formed pavement or profiled audible pavement.

~~33~~19. The method according to claim ~~32~~18, wherein the optical components comprise a first component and a second component, wherein the first component has a different specific gravity to the second component, and wherein the first component is dropped at a different rate to the second component.

~~34~~20. The method according to claim ~~33~~19, wherein the first component and second component are dropped simultaneously.

~~35~~21. The method according to any one of claims ~~32–~~18 to ~~34~~20, wherein the first component is dropped at a rate of 250 to 500 g/m^2, and the second component is dropped at a rate of 200 to 400 g/m^2.

~~36~~22. The method according to any one of claims ~~32~~–18 to ~~35~~21, wherein the first component comprises transparent glass beads and the second component comprises microcrystalline ceramic beads.