primers for corrosion protection, NACE International, paper no. 07007 (2007)). These accelerated weathering methods seek to intensify the effects from the environment so that the film breakdown occurs more rapidly (Mitchell, M. J., Progress in offshore coatings, NACE International, paper no. 04001 (2004)). Lower rust creep means better overall anticorrosive performance.

Summary

The present disclosure describes a coating composition comprising: a) a binder system selected from epoxy-based binder systems, silicate-based binder systems, polysiloxane-based binder systems, polyurethane-based binder systems, cyclized rubber-based binder systems, and phenoxy resin-based binder systems, b) zinc particles, c) microspheres, and d) at least 0.1% by weight of a conductive pigment selected from the group consisting of graphite, carbon black, graphene, aluminium, black iron oxide, antimony-doped tin oxide, mica coated with antimony-doped tin oxide, carbon nanotubes, carbon fibres, and any mixture thereof, wherein said microspheres are of spheroidal shape and made of a material selected from glass, ceramics, polymeric materials, and mixtures thereof. In one example, there is disclosed a coating composition comprisinga) a binder system selected from epoxy-based binder systems, silicate-based binder systems, polysiloxane-based binder systems, polyurethane-based binder systems, cyclized rubber-based binder systems, and phenoxy resin-based binder systems, b) zinc particles, c) microspheres, and d) at least 0.1% by weight of a conductive pigment selected from the group consisting of graphite, carbon black, graphene, aluminium, black iron oxide, antimony-doped tin oxide, mica coated with antimony-doped tin oxide, carbon nanotubes, carbon fibres, and any mixture thereof, wherein said microspheres are of spheroidal shape and made of a material selected from glass, ceramics, polymeric materials, and mixtures thereof, with the proviso that said microspheres are not hollow glass microspheres. In one aspect, the present invention refers to a coating composition comprising a) a binder system selected from epoxy-based binder systems, silicate-based binder systems, polysiloxane-based binder systems, polyurethane-based binder systems, cyclized rubber-based binder systems, and phenoxy resin-based binder systems, b) zinc particles,

c) microspheres, and d) a conductive pigment selected from the group consisting of graphite, carbon black, graphene, aluminium, black iron oxide, antimony-doped

tin oxide, mica coated with antimony-doped tin oxide, carbon nanotubes, carbon fibres, and any mixture thereof, wherein said microspheres are of spheroidal shape and made of a material selected from glass, ceramics, polymeric materials, and mixtures thereof, with the proviso that said microspheres are not hollow glass microspheres, and wherein said conductive pigment is present in an amount of between 0.3 to 8.0% by weight of the composition. In another aspect, the present invention refers to a kit of parts containing a coating composition as disclosed herein comprising two or more containers, wherein one container contains one or more curing agents and another container contains the remaining components of part a) as disclosed herein. In yet another aspect, the present invention refers to a coated structure comprising a metal structure having a coating of the coating composition as defined herein applied onto at least a part of the metal structure. In a further example, the present invention refers to a method of coating a metal structure, comprising the step of applying to at least a part of said metal structure thereof a layer of a coating composition as defined herein.

In one example, in the coating composition as disclosed herein, said microspheres are not hollow glass microspheres.

Detailed description of the invention

The binder system may be selected from epoxy-based binder systems, silicate-based binder systems, polysiloxane-based binder systems, polyurethane-based binder systems, cyclized rubber-based binder systems, and phenoxy resin-based binder systems. The addition of zinc, microspheres, and conductive pigment is beneficial to each of these binder systems. However, the effect may be more pronounced in some of the binder systems. In one embodiment of the present invention, the binder system selected from epoxy-based binder systems, polysiloxane-based binder systems, polyurethane-based binder systems, cyclized

Claims

1. A coating composition comprising:

a) a binder system selected from epoxy-based binder systems, silicate-based binder systems, polysiloxane-based binder systems, polyurethane-based binder systems, cyclized rubber-based binder systems, and phenoxy resin-based binder systems,

b) zinc particles,

c) microspheres, and

d) a conductive pigment selected from the group consisting of graphite, carbon black, graphene, aluminium, black iron oxide, antimony-doped tin oxide, mica coated with antimony-doped tin oxide, carbon nanotubes, carbon fibres, and any mixture thereof,

wherein said microspheres are of spheroidal shape and made of a material selected from glass, ceramics, polymeric materials, and mixtures thereof, with the proviso that said microspheres are not hollow glass microspheres, and wherein said conductive pigment is present in an amount of between 0.3 to 8.0% by weight of the composition.

2. The coating composition according to claim 1, wherein said microspheres are selected from the group consisting of solid glass microspheres, hollow ceramic gas-filled microspheres, hollow ceramic microspheres having a true density in the range of 0.6 to 2.5, solid ceramic microspheres, poly-methyl metacrylate microspheres, acrylic microspheres, polyethylene microspheres, acrylonitrile microspheres, and mixtures thereof.

3. The coating composition according to claim 1 or 2, wherein the conductive pigment is selected from carbon black, graphene, carbon fibres, carbon nanotubes, graphite, mica coated with antimony-doped tin oxide, and any mixture thereof.

4. The coating composition according to claim 3, wherein the conductive pigment is graphite.

5. The coating composition according to claim 3, wherein the conductive pigment is carbon black.

6. The coating composition according to any one of the preceding claims, wherein said binder system is a binder system selected from epoxy-based binder systems, polysiloxane-based binder systems, polyurethane-based binder systems, cyclized rubber-based binder systems, and phenoxy resin-based binder systems.

7. The coating composition according to claim 6, wherein said binder system is an epoxy-based binder system.

8. The coating composition according to claim 1, wherein said binder system is a silicate-based binder system.

9. The coating composition according to any one of the preceding claims, wherein the composition further comprises a solvent.

10. The coating composition according to any one of the preceding claims, wherein the microspheres are present in an amount of between about 5 and 50% by solids volume.

11. The coating composition according to any one of the preceding claims, wherein said microspheres are selected from the group consisting of solid glass microspheres, hollow ceramic gas-filled microspheres, hollow ceramic microspheres having a true density in the range of 0.6 to 2.5, solid ceramic microspheres, acrylic microspheres, polyethylene microspheres, and mixtures thereof.

12. The coating composition according to claim 11, wherein wherein said microspheres are selected from the group consisting of solid glass microspheres, hollow ceramic microspheres having a true density in the range of 0.6 to 2.5, and mixtures thereof.

13. A kit of parts containing a coating composition as defined in claim 6 comprising two or more containers, wherein one container contains one or more curing agents and another container contains the remaining components of part a) as defined in claim 6.

14. The kit of parts according to claim 13, wherein the components b) and c) as defined in claim 1 are contained in the same container as the components of part a)

other than the one or more curing agents, and wherein component d) is contained in the same container as the one or more curing agents.

15. A coated structure comprising a metal structure having a coating of the coating composition defined in any one of claims 1 to 12 applied onto at least a part of the metal structure.

16. A method of coating a metal structure, comprising the step of applying to at least a part of said metal structure thereof a layer of a coating composition as defined in any one of claims 1 to 12.