iii. a co-binder comprising a silicone polymer in an epoxy resin in the form of a silicone core shell rubber, wherein the silicone polymer constitutes between 1.4 % - 8 % silicone polymer based on volume solids of the paint composition; and

b. allowing said curable paint film to cure to obtain the epoxy paint coat.

Further provided herein, in another example, is method for improving the cleanability of an epoxy paint coat on a surface, said method comprising the steps of:

a) applying a paint composition onto the surface thereby forming a curable paint film on the surface, which composition comprises an epoxy based binder system of:

i. one or more epoxy resins,

ii. one or more curing agents, and

iii. a co-binder comprising a silicone polymer in an epoxy resin, wherein the silicone polymer constitutes at least 1.4 % silicone polymer based on volume solids of the paint composition; and

b) allowing said curable paint film to cure to obtain the epoxy paint coat.

Also provided herein, in another example, is the use of a paint composition comprising component (i), component (ii) and component (iii) as defined herein for improving the cleanability of an epoxy paint coat on a surface.

In another aspect, there is provided the use of a paint composition comprising component (i), component (ii) and component (iii) as defined above for improving the cleanability of an epoxy paint coat on a surface, wherein the epoxy paint coat is on the surface of a cargo hold for carrying solid cargos.

Further provided herein, in another example, is a paint composition comprising component (i), component (ii) and component (iii) as defined herein.

Yet further provided herein, in another example, is a kit-of-parts for use in the method as described herein, said kit comprising a first container comprising component (i) and component (iii); and a second container comprising component (ii); or said kit comprising a first container comprising component (i); a second container comprising component (ii) and a third container comprising component (iii); wherein component (i), component (ii) and component (iii) are as defined herein.

Further details of the disclosure are presented in the following detailed description, the examples and the dependent claims.

DETAILED DESCRIPTION OF THE INVENTION

It has now been found that improved cleanability of an epoxy paint coat can be achieved through particular paint coat formulations. It has further been found that both improved cleanability, good abrasion resistance, good impact resistance and corrosion resistance may be obtained through particular paint coat formulations as described herein.

In a first aspect, therefore, a method for improving the cleanability of an epoxy paint coat on a surface is provided. In a second aspect, the use of a paint composition as defined herein for improving the cleanability of an epoxy paint coat on a surface is provided. A paint composition per se, and a kit-of-parts for use in the inventive method are also provided.

When a surface is provided with "improved cleanability", it means that the surface – after the treatment in question – becomes easier to clean post-soiling. Providing "improved cleanability" to a surface also means that said surface becomes less liable to pick up dirt in the first place; i.e. it becomes more resistant to soiling.

CLAIMS

1. A method of improving the cleanability of an epoxy paint coat on a surface, wherein the epoxy paint coat is on the surface of a cargo hold for carrying solid cargos, said method comprising the steps of:
    a. applying a paint composition onto the surface thereby forming a curable paint film on the surface, which composition comprises an epoxy based binder system of:
        i. one or more epoxy resins,
        ii. one or more curing agents, and
        iii. a co-binder comprising a silicone polymer in an epoxy resin in the form of a silicone core shell rubber, wherein the silicone polymer constitutes between 1.4 % - 8 % silicone polymer based on volume solids of the paint composition; and
    b. allowing said curable paint film to cure to obtain the epoxy paint coat.

2. The method according to claim 1, wherein the silicone polymer constitutes at least 1.6 % silicone polymer based on volume solids of the paint composition, the silicone polymer constitutes at least 2.0 % silicone polymer based on volume solids of the paint composition, the silicone polymer constitutes at least 2.2 % silicone polymer based on volume solids of the paint composition or the silicone polymer constitutes at least 2.5 % silicone polymer based on volume solids of the paint composition.

3. The method according to any one of the preceding claims, wherein the silicone polymer constitutes at the most 7 % silicone polymer based on volume solids of the paint composition or the silicone polymer constitutes at the most 6 % silicone polymer based on volume solids of the paint composition.

4. The method according to any one of the preceding claims, wherein the silicone core shell rubber is epoxy-functional.

5. The method according to any one of the preceding claims, wherein the silicone core shell rubber is mixed in the epoxy resin.

6. The method according to any one of the preceding claims, wherein the epoxy-functional silicone core shell rubber has a silicone core and a plurality of epoxy surface moieties.

7. The method according to claim 1, wherein component (iii) is added in an amount of between 4-25 % based on volume solids of the paint composition, in an amount of between 6-20 % based on volume solids of the paint composition or in an amount of between 7-17 % based on volume solids of the paint composition.

8. The method according to any one of the preceding claims, wherein the ratio of silicone polymer: epoxy resin in component (iii) is in the range of 1:10 – 1:1, preferred in the range of 1:6 – 1:1, more preferred in the range of 1:5 - 1:1 and most preferred in the range of 1:4 – 1:1 such as 1:3 – 1:1.5.

9. The method according to any one of the preceding claims, wherein the epoxy resin in component (iii) is one or more epoxy resins selected from the group consisting of bisphenol A, bisphenol F, Novolac epoxies, reactive diluents, non-aromatic epoxies, cycloaliphatic epoxies, glycidyl esters and epoxy functional acrylics or any combinations hereof.

10. The method according to any one of the preceding claims, wherein the one or more epoxy resins (component i) is selected from the group consisting of bisphenol A, bisphenol F, Novolac epoxies, reactive diluents, non-aromatic epoxies, cycloaliphatic epoxies, glycidyl esters and epoxy functional acrylics or any combinations hereof.

11. The method according to any one of the preceding claims, wherein the one or more curing agents is selected from the group consisting of polyamides, aliphatic amines, cycloaliphatic amines, polyamines, polyamidoamines, polyoxyalkylene amines, aminated polyalkoxyethers, aliphatic amines, aralkylamines, aromatic amines, Mannich bases, amino functional silicones or silanes, and including epoxy adducts and derivatives thereof.

12. The method according to any one of the preceding claims, wherein the one or more curing agents comprises a polyamide and/or a polyamine.

13. The method according to any one of the preceding claims, wherein the one or more curing agents comprises Mannich bases.

14. The method according to any one of the preceding claims, wherein the one or more curing agents does not comprise Mannich bases.

15. The method according to any one of the preceding claims, wherein the coating composition comprises one or more pigments and/or fillers.

16. The method according to any one of the preceding claims, wherein the paint composition comprises a plasticizer selected from the group consisting of hydrocarbon resins, phthalates, esters, benzoates, phosphates, paraffins, amides, and benzyl alcohol.

17. The method according to any one of the preceding claims, wherein the paint composition comprises 1-7% by solids volume of the paint of an aluminium pigment, bauxite or glass spheres.

18. The method according to any one of the preceding claims, wherein the coating composition is obtained by mixing the components of the epoxy based binder system by first combining component (i) and component (iii) followed by addition of component (ii) or by combining all three components of the epoxy based binder system.

19. The method according to any one of the preceding claims, wherein the paint composition is applied directly on the surface.

20. The method according to any one of the preceding claims, wherein a primer layer is applied to the surface prior to application of the paint composition.

21. Use of a paint composition comprising component (i), component (ii) and component (iii) as defined in any one of claims 1-20 for improving the cleanability of an epoxy paint coat on a surface, wherein the epoxy paint coat is on the surface of a cargo hold for carrying solid cargos.