Claims

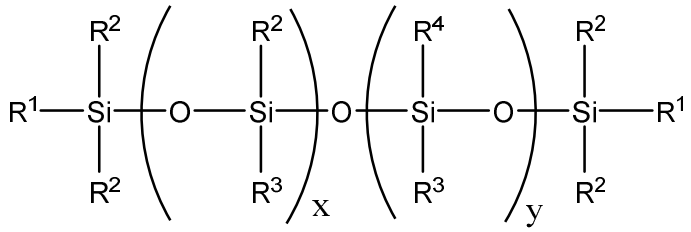
1. A coating system comprising at least two layers A and B, where said layers A and B are adjacent and wherein layer A is an organic primer layer and wherein layer B comprises a waterborne fouling release coating composition comprising:
   (a) 50 to 90 wt%, relative to the total weight of the composition as a whole, of an aqueous polysiloxane-based binder emulsion, wherein said emulsion comprises polysiloxane-based binder droplets having an average droplet size of 4 to 1000 nm; and
   (b) at least one pigment or filler;
   wherein the coating composition comprises at least 10 wt% water relative to the total weight of the composition as a whole.

2. The coating system as claimed in claim 1, wherein said waterborne fouling release coating composition has a volatile organic compound (VOC) content of less than 80 g/L, preferably less than 50 g/L, more preferably less than 25 g/L, even more preferably 0 g/L.

3. The coating system as claimed in claim 1 or 2, wherein said polysiloxane-based binder droplets have an average size of 50 to 350 nm, preferably 100 to 300 nm.

4. The coating system as claimed in any of claims 1 to 3, wherein the polysiloxane-based binder is a linear or branched polysiloxane-based binder.

5. The coating system as claimed in any of claims 1 to 4, wherein said polysiloxane-based binder has the general formula (I)



(I)

wherein

each R^1 is independently selected from a hydroxyl group, C_{1-6}-alkoxy group, C_{1-6}-hydroxyl group, C_{1-6}-epoxy containing group, C_{1-6} amine group, C_{1-10} alkyl group, C_{6-10} aryl, C_{7-10} alkaryl or $O\text{-}Si(R^5)_{3-z}(R^6)_z$;

each R^2 is independently selected from C_{1-10} alkyl, C_{6-10} aryl, C_{7-10} alkylaryl or C_{1-6} alkyl substituted by poly(alkylene oxide) and/or a group as described for R^1;

each R^3 and R^4 is independently selected from C_{1-10} alkyl, C_{6-10} aryl, C_{7-10} alkylaryl or C_{1-6} alkyl substituted by poly(alkylene oxide);

each R^5 is independently a hydrolysable group such as C_{1-6} alkoxy group, an acetoxy group, an enoxy group or ketoxy group;

each R^6 is independently selected from a C_{1-6} alkyl group;

z is 0 or an integer from 1-2;

x is an integer of at least 2;

y is an integer of at least 2.

6. The coating system as claimed in any of claims 1 to 5, wherein the weight average molecular weight of the polysiloxane-based binder is 400 – 150 000, preferably 1000 to 140 000, more preferably 5000 – 130 000, even more preferably 10 000 to 120 000 g/mol.

7. The coating system as claimed in any of claims 1 to 6, wherein said waterborne fouling release coating composition further comprises an additive oil preferably a hydrophilic modified polysiloxane oil and/or a hydrophobic modified polysiloxane oil.

8. The coating system as claimed in any of claims 1 to 7, wherein said waterborne fouling release coating composition further comprises a biocide.

9. The coating system as claimed in any of claims 1 to 8, wherein said waterborne fouling release coating composition comprises 55 to 85 wt% of the aqueous polysiloxane-based binder emulsion, relative to the total weight of the composition as a whole.

10. The coating system as claimed in any one of claims 1 to 9, wherein layer A is an epoxy primer layer.

11. The coating system as claimed in any one of claims 1 to 10, wherein layer A and/or layer B have been cured.

12. A substrate coated with a cured coating system as claimed in any of claims 1 to 11.

13. The substrate as claimed in claim 12, wherein said substrate is the surface of a marine structure, preferably a marine structure which is submerged when in use.