A fourth aspect of the invention relates to a marine structure comprising on at least a part of the outer surface thereof an outermost fouling release coat as defined herein.

A further aspect of the invention relates to a cured fouling release coat comprising a polysiloxane-based binder matrix from a polysiloxane based binder which is a functional organopolysiloxane with terminal and/or pendant functionality, said polysiloxane-based binder matrix constituting 50-90 % by dry weight of the coat, one or more enzymes and one or more hydrophilic-modified polysiloxane oils in an amount of 0.05-10 % by dry weight of the coat.

A further aspect of the invention relates to a kit for preparing the fouling release coat comprising one or more enzymes and one or more hydrophilic-modified polysiloxane oils as described herein, said kit comprising a first container holding a polysiloxane binder base, and a second container holding a siloxane curing agent and optionally a catalyst, wherein polysiloxane binder base of the first container is curable in the presence of the content of the second container, the kit further comprises one or more enzyme either as a constituent of the first container or a constituent of the second container, or alternatively in a third container.

A further aspect of the invention relates to a fouling release coating composition comprising a polysiloxane-based binder system including a polysiloxane-based binder which is a functional organopolysiloxane with terminal and/or pendant functionality, said polysiloxane-based binder system constituting 50-90 % by dry weight of the coating composition, said binder system comprising one or more polysiloxane components modified with hydrophilic oligomer/polymer moieties, and one or more enzymes and one or more hydrophilic-modified polysiloxane oils in an amount of 0.05-10 % by dry weight of the coating composition.

A further aspect of the invention relates to a fouling release coating composition comprising a polysiloxane-based binder system including a polysiloxane-based binder which is a functional organopolysiloxane with terminal and/or pendant functionality, said polysiloxane-based binder system constituting 50-90 % by dry weight of the coating composition, 0.01-20 % by dry weight of one or more hydrophilic-modified polysiloxane oils, and one or more enzymes.

DETAILED DISCLOSURE OF THE INVENTION

The cured paint coat

As mentioned above, the present invention provides a cured paint coat comprising a polysiloxane-based binder matrix, preferably constituting at least 40 % by dry weight of the coat, and one or more enzymes.

The paint coat is preferably used as the top coat in a coating system comprising two or more paint coat layers (e.g. at least a primer coat and a tie coat in addition to the top coat).

The one or more enzymes

Inclusion of the one or more enzymes in the fouling release coat improves the resistance towards bio-fouling of said polysiloxane-based fouling release coat. The enzymes contribute to the fouling release properties of the coating by preventing settlement before or during, or alternatively reverting settlement. Even though siloxane-based fouling release coatings are very good at hindering settlement of bio-fouling organisms, enzymes can contribute to the overall antifouling ability of a fouling release coating, either by selected targeted mechanisms towards specifically troublesome bio-fouling species, or by a general improvement of the protection mechanism via a broad spectrum antifouling mechanism.

All enzymes capable of preventing settlement of bio-fouling organisms are considered relevant for this invention. However of particular interest are hydrolytic enzymes. Hydrolytic enzymes are those selected from EC class 3. Of particular interest are those selected from the following EC classes:

EC 3.1 : ester bonds (esterases: nucleases, phosphodiesterases, lipase, phosphatase)
EC 3.2: sugars (DNA glycosylases, glycoside hydrolase)
EC 3.3: ether bonds
EC 3.4: peptide bonds (Proteases/peptidases)
EC 3.5: carbon-nitrogen bonds, other than peptide bonds
EC 3.6 acid anhydrides (acid anhydride hydrolases, including helicases and GTPase)
EC 3.7 carbon-carbon bonds