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"AN IMPROVED ANTICORROSIVE PAINT PARTICULARLY USEFUL AS PRIMER IN MARINE ENVIRONMENT".

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The following specification particularly describes and ascertains the nature of this invention and the manner in which it is to be performed :-

PRICE : TWO RUPEES

This is an invention by Kummattithidal Santhanam Rajagopalan, Subbiah Nadar Guruviah, Scientists, Venkatasubramanian Chandrasekharan, Senior Scientific Assistant, all from Central Electrochemical Research Institute, Karaikudi, and all are Indian citizens.

This invention relates to an improved anticorrosive paint particularly useful as primer in marine environment.

Hitherto zinc pigmented paint in organic medium have been produced and used with a zinc content of 75-80%.

The object of the present invention is to develop an improved zinc pigmented paint in which the zinc in part is substituted and the performance of the paint is better than the one in use.

The other objects of the invention are :

1. the develop paint which gives better protection than known paints,
2. a lower amount of zinc is used than in the known paint,
3. can be applied by brush or spray under widely varying weather and climatic condition,
4. does not rely on temperature and humidity for proper curing,
5. gives sacrifical protection to steel, and
6. the cost of protection is lower than the conventional primer by 15-20%.

Accordingly this invention provides an improved anti-corrosive paint particularly useful as primer in marine environment

comprising zinc dust and a resin in an organic solvent characterised in that the paint contains 25-30% of manganese.

According to another feature of the invention the resin used includes epoxy resin.

According to still another feature, the paint contains a curing agent.

According to yet another feature of the innvention the paint contains a vehicle.

According to a further feature of the invention, the ingredients present are :

i) 60-65% of zinc dust

ii) 25-30% manganese

iii) 5-10% of the resin, and

iv) balance of xylene or toluene.

According to a still further feature of the invention the zinc dust used is of 95-98% purity with less than 0.005% Fe manganese u sed is of 97% purity and graphite used is with 98-99% purity.

The solvent employed may be selected from xylene and toluene. The vehicle is selected from chlorinated rubber or chlorinated paraffin. .. Thus a better type of metal pigmented paint is developed by incorporating of 60-65% zinc dust (95-98% pure) and 25-30% manganese (96-97% pure) or zinc dust 65-70% and 5-10% + chlorinated paraffin and grinding well to form uniform paste and adjusting the consistency with xylene or toluene to form a brushable paint. The paint thus obtained gives high degree of protection to steel in marine environments.

The present invention consists in the preparation of zinc pigmented paint incorporating,

60-65% zinc dust (of purity 95-98% and having less than 0.005% Fe) and 25-30% Manganese (of purity of 97%) in epoxy resin + curing agent + chlorinated rubber resin or chlorinated paraffin

and grinding well to form an uniform paste and adjusting the consistency with xylene or toluene to form a brushable paint, which becomes touch dry in 10 minutes and forms hard and adherent coating in six hours and gives both cathodic protection and barrier-protection in immersion, salt spray and field exposure tests.

The invention is further illustrated with the following examples :

Example - 1

90 grams of zinc dust is incorporated in 10 grams of epoxy polyamide or chlorinated rubber and ground well for 15-30 minutes to form a uniform paste. To this 20 cc of xylene is added to form a brushable paint.

Example - 2

Equal amounts by weight of epoxy resin and chlorinated rubber resin are mixed thoroughly and 20 grams of this is used as the vehicle in which 71 grams of zinc dust and 8 grams of graphite powder are incorporated after thorough mixing and the whole is ground well for 15-30 minutes to form an uniform paste. 25 cc of xylene is added to form a brushable paint.

Example - 3 156912

Chlorub -20 resin and chlorinated paraffin taken in the weight ratio of 5:3 are mixed thoroughly and 10 grams of this is taken and diluted with about 5-10 cc of toluene. Equal amounts by weight of epoxy resin and chlorinated rubber resin are mixed thoroughly and 10 grams of this is taken and dilutedwith about 5-10 cc of xylene,and to either of the above two used as vehicle a thorough mixture of 63 grams of zinc dust and 27 grams of Manganese powder is added and the whole is ground to form an uniform paste. To this about 10-15 cc of xylene or toluene is added to form a brushable paint.

The properties like drying time, pot-life and specific gravity were determined and the values are given in table 1.

The paints prepared by the above methods were applied on pickled mild steel specimens and evaluated by accelerated tests, electrochemical tests and by exposure tests at Mandapam Camp. The thickness of the coating is of the order of 2.5-3 mils. In the case of coated specimens for exposure studies Zinc/ Manganese primer finishing paint coated specimens were used. The results are given in table 2 and 3.

It can be observed from tables 2 and 3 that better performance are shown by them paints given in example-s 2 and 3 even though the zinc content in them is reduced substantially by part-substitution with Manganese or Graphite, than the paints available in the market. It can also be seen from Table 2 that the duration of cathodic protection given by the paint is longer in the case of developed paints than those available in the market. The duration for which the potential values remain more negative than -750 mV vs SCE in 3% NaCl for trade sample is also lesser than the developed paints which contain much lesser amount of zinc.

TABLE - 1

PHYSICAL PROPERTIES OF THE PAINTS

ZINC RICH PAINTS

(2 Pack)

Property	For paint as in example 1	For paint as in example 2	For paint as in example 3	Trade Sample
Weight per litre	2.7-3kg	2.0-2.3 kg	2.7-3.0 kg	2.5-3.0 kg
Zinc content by weight	90-92%	71%	63%	80%
Pot life		6 hours		6-10 hours
Drying				
(1) Touch dry		10 minutes		10 minutes
(2) Hard dry		2-3 hours		2-3 hours

TABLE - 2

IMMERSION TEST FOR 30 DAYS 156912

Paint No. as in Example	Zinc content %	No. of days reach the potential value of -750mV with reference to 3% NaCl	No. of days the protective current of 100 uA/sq. in is maintained between painted and unpainted MS specimen in 3% NaCl	Distilled Water	For 30 days 3% NaCl	Salt fog tests for 30 days.
1	90	28	30	No rust at scratches and no blisters	No rust at scratches and no blisters	No change
2	71	25	27	"	"	"
3	63	25	30	"	"	"
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] coloures Rust at scratch	[illegible] scratches Fine blisters on the surface	[illegible] over and few blisters on the surface.

MANDAPAM CAMP EXPOSURE SITE

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Period 16 months

	Paint scheme	Merit value	Percentage
1	Zinc/Manganese in epoxy polyamide + Chlorinated rubber finishing paint		74
2	Zinc Manganese in epoxy polyamide + coal tar epoxy finishing paint		74
3	Zinc/Manganese in chlorinated rubber + chlorinated rubber finishing paint		67
4	Zinc Manganese in chlorinated rubber + epoxy coal tar finishing paint		72
5	Prop rietory zinc rich pa-int + chlorinated rubber as finishing paint		53

The paint of the present invention is not a mere admixture resulting in the aggregate of the properties of the components thereof

We claim

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1. An improved anti corrosive paint particularly useful as primer in marine environment comprising zinc dust and a resin in an organic solvent characterised in that the paint contains 25-30% of manganese.

2. An improved anti corrosive paint as claimed in claim 1 wherein the resin used is an epoxy resin.

3. An improved anti corrosive paint as claimed in claim 1 & 2 wherein the paint contains a curing agent.

4. An improved anti corrosive paint as claimed in claim 1 & 2 wherein the paint contains a vehicle.

5. An improved anti corrosive paint as claimed in claim 4 wherein the vehicle is selected from chlorinated rubber or chlorinated paraffin.

6. An improved anti corrosive paint as claimed in any one of the preceding claims wherein the solvent is selected from xylene or toluene.

7. An improved anti corrosive paint as claimed in any one of the preceding claims where the paint consist of

(i) 60-65% of zinc dust

(ii) 25-30% of manganese.

(iii) 5-10% of the resin.

(iv) The balance of xylene or toluene.

8. An improved anti corrosive paint particularly useful as primer in the marine environment substantially as herein described with reference to the example 3.

Dated this 24th day of September 1981

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