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Index at acceptance—103[XLV(1)].

IMPROVEMENTS IN OR RELATING TO INHIBITIVE PRIMERS.

PROVISIONAL SPECIFICATION.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, Rafi Marg, New Delhi-1, India, an Indian registered body incorporated under the Registration of Societies Act (Act XXI of 1860).

This is an invention by KUMMATTITHIDAL SANTHANAM RAJAGOPALAN, Scientist and SUBBIAH NADAR GURUVIAH, Scientist, both of the Central Electrochemical Research Institute, Karaikudi-3, India, both Indian citizens.

The following specification describes the nature of this invention.

This invention relates to improvements in or relating to Corrosion Inhibitive Primers.

Hitherto it has been proposed to use as corrosion inhibitive primers oleoresinous varnishes containing lead compound such as litharge, red lead, calcium plumbate and chromates such as zinc chromate, barium potassium chromate, strontium chromate. Also paints containing more than 90% zinc powder in vehicles such as polystyrene are also known.

This procedure of incorporating lead compounds, zinc and strontium chromates as inhibitive pigments and metallic zinc in varnishes to produce inhibitive primers suffers from the drawback that the pigments are produced from imported lead, zinc and strontium salts.

The object of this invention is to use a readily available ingredient material as pigment in oleoresinous varnishes and thus reduce the need to import the raw materials for the manufacture of inhibitive pigments.

The invention consists in the use of iron powder (83% as metallic ion) as pigment in oleoresinous varnishes so as to obtain a paint which when applied to structural steel gives it protection against corrosion.

Examples of varnishes prepared in the laboratory and tested for corrosion protection are given below :

Example 1

Iron powder was ground to pass through 200 mesh sieve and the 200 mesh iron (83% as metallic powder) mixed with double boiled linseed oil to I. S. Specification No. IS. 77 (1950), and sufficient turpentine is added and again ground till the powder is uniformly dispersed. Then the viscosity was adjusted by suitable addition of turpentine to get a brushable primer.

Example 2

Iron powder was ground to pass through 200 mesh sieve and the 200 mesh iron powder mixed with long oil linseed penta alkyd and sufficient turpentine added and again ground till the powder is uniformly dispersed. Then the viscosity was adjusted by suitable additions of turpentine to get a brushable primer.

The composition of the paints thus prepared are given in Table 1.

TABLE 1

Paint	Iron powder gms	Vehicle	Solvent
Example 1 .	20	15	10
Example 1 .	20	15	10

Protection against corrosion given by the primers cited above is shown in Table 2.

TABLE 2

Protection against corrosion by primers based on iron powder.

	Condition of polished steel specimens coated with one coat of primer after immersion for 15 days in	
	distilled water	1% sodium chloride solution
1. Iron oxide primer in linseed oil media .	a large number of pin points of rust	considerably rusted.
2. Red lead in linseed oil	steel surface unaffected and remains bright.	steel surface unaffected and remains bright.
3. Primer described in Example 1 .	"	"
4. Primer described in Example 2 . .	"	"

It is seen from the above table that a non-inhibitive primer like iron oxide in linseed oil does not give full protection against corrosion. Like the inhibitive red lead primer, iron powder, primers corresponding to Examples 1 & 2 also seen to give good protection against corrosion.

The main advantage of the invention is an indigenously available material can be used as an inhibitor pigment in place of pigments made from imported material.

R. BHASKAR PAI,
Patents Officer,
COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH.

Dated this 20th day of July 1967.

COMPLETE SPECIFICATION.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, Rafi Marg, New Delhi-1, India an Indian registered body incorporated under the Registration of Societies Act (Act XXI of 1860).

This is an invention by KUMMATTITHIDAL SANTHANAM RAJAGOPALAN, Scientist and SUBBIAH NADAR GURUVIAH, Scientist, both of the Central Electrochemical Research Institute, Karaikudi-3, India, both Indian citizens.

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

Annotated title of the invention :

This invention relates to improvement in or relating to Corrosion Inhibitive Primers for Protective Schemes for Structural Steel.

Prior Knowledge :

Hitherto it has been proposed to use as corrosion inhibitive primers oleoresinous varnishes containing lead compounds such as litharge, red lead and calcium

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plumbate and chromates such as zinc chromate, barium potassium chromate and strontium chromate. Also, paints containing more than 90% of zinc powder in vehicles such as polystyrene are known.

Drawbacks connected with hitherto known processes/ devices :

Incorporation of lead compounds, zinc and strontium chromates as inhibitive pigments and metallic zinc in varnishes to produce inhibitive primers suffers from the drawback that the pigments are produced from imported lead, zinc and strontium salts.

Object of the invention :

The object of the invention is to prepare an inhibitive primer based on the use of iron powder as pigment in oleoresinous varnishes available in this country.

Main finding :

Inhibitive primers are produced by grinding together, the requisite amounts of iron powder and oleoresinous varnishes, in a triple roller mill, and thinning with turpentine.

New result :

The quantum of import of inhibitive pigments based on zinc and lead will be brought down since inhibitive primer can be made from indigenously produced electrolytic iron.

Statement of Invention :

According to the present invention, the process for the preparation of inhibitive primers consists in grinding together oleoresinous varnish and iron powder in the proportion of 55-70% of iron powder and 45-30% of oleoresinous varnish.

The iron powder is electrolytic iron of 83% purity. The oleoresinous varnishes are *e.g.*, double boiled oil, long oil linseed alkyd, linseed stand oil, or modified phenolic stand oil.

A dried *e.g.*, based on lead, cobalt or manganese soap is incorporated in the inhibitive primer.

A suitable solvent, *e.g.*, turpentine is incorporated in the inhibitive primer.

The inhibitive primers give protection to steel from corrosion of the same order as of other inhibitive primers *e.g.*, zinc chromate primer.

Thus, the process consists in producing inhibitive primers by grinding together known amounts of electrolytic iron powder (83% metallic iron), oleoresinous varnish, *e.g.*, double boiled oil, long oil linseed alkyd, linseed stand oil and modified phenolic stand oil, a suitable drier *e.g.*, lead, cobalt, manganese salts and a suitable solvent *e.g.*, turpentine. The composition and properties of such inhibitive primers are given in Tables IA & IB. The performance in corrosion protection tests in comparison with zinc chromate, 'red-lead' primers to specification is given in Table II.

TABLE IA

*Composition and Properties of Inhibitive Primers using Electrolytic Iron Powder.**

Vehicle	Composition of paint (Percentage by wt.)		Properties				
	Iron Powder	Vehicle	Thinner	Consistency	Drying time	Colour	Adhesion
1. Double boiled oil	66	27	remainder	smooth & uniform	18 hrs.	Grey to black	Good
2. Long oil linseed alkyd	59	30	"	"	"	"	"
3. Linseed stand oil	59	30	"	"	"	"	"
4. Modified phenolic stand oil.	59	30	"	"	"	"	"

*Drier is added only to the extent of less than 0·1% so it is not given in a separate column.

TABLE IB

Composition of Iron Powder.

Metallic Iron	83%
Total Iron	94%
Carbon	0·4%
Sulphur	0·01%
Mn	0·04%
P	0·02%
Si	0·01%

TABLE II

Performance in Corrosion Protection Tests in Composition with Well-known Primers.

Primer	Immersion in		A.R.E. Salt drop-let test.	Per cent. water absorption in 15 days.	Field exposure in marine atmosphere for 4 months.
	distilled water for 15 days.	1% NaCl solution for 15 days			
1. Primer based on iron powder	Small blisters steel surface bright.	Small blisters steel surface bright.	No blisters, steel surface bright except at edges.	5-10	No change.
2. Zinc-chromate primer to I.S. Specification.	"	No blisters, steel surface bright.	No blisters steel surface bright.	20-30	No change.
3. Red lead primer to I.S. Specification.	"	"	"	10-15	"
4. Red oxide primer to I.S. Specification.	Small blisters & rust spot all over.	Big blisters large Nos, of rust spots.	Blisters steel surface rusted.	20-30	"

Example 1

Electrolytic iron powder is ground, passed through 200 mesh sieve and −200 powder is ground with double boiled linseed oil of I.S. specification No. 77, 1950 in a triple roller mill and sufficient turpentine is added to get brushable consistency.

Example 2

Electrolytic iron powder is ground to pass 200 mesh sieve and −200 powder is ground with linseed stand oil of I.S. 79 (1950) to which drier has been added in a triple roller mill and sufficient turpentine is added to get brushable consistency.

Advantages of the invention:

(1) raw materials for the manufacture of this pigment are indigenously available.

(2) this pigment is cheaper than inhibitive pigments based on zinc or lead which are scarce.

We claim:

1. A process for the preparation of Inhibitive Primers which consists in grinding together oleoresinous varnish and iron powder in the proportion of 55-70% of iron powder and 45-30% of oleoresinous varnish.

2. A process as claimed in Claim 1 wherein the iron powder is electrolytic iron of 83% purity.

3. A process as claimed in Claim 1 wherein the oleoresinous varnishes are double boiled oil, long oil linseed alkyd, linseed stand oil, or modified phenolic stand oil.

4. A process as claimed in any of the preceding claims wherein a drier based on lead, cobalt or manganese soap is incorporated in the inhibitive primer.

5. A process as claimed in any of the preceding claims wherein turpentine is incorporated in the inhibitive primer.

6. Inhibitive primers which give protection to steel from corrosion of the same order as of other inhibitive primers *e.g.*, zinc chromate primer whenever produced according to a process claimed in any of the preceding claims.

R. BHASKAR PAI,

Patents Officer,

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH.

Dated this 24th day of May 1968.

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