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Index at Acceptance—103[XLV(1)], 144A [XII(3)]

### PROVISIONAL SPECIFICATION

#### IMPROVEMENTS IN OR RELATING TO CHEMICAL PHOSPHATING OF IRON AND STEEL SURFACE

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).

*The following specification describes the nature of this invention :—*

This is an invention by BHAGAVATHI SATHIANANDHAM, Junior Scientific Assistant and KRISHNASWAMY BALAKRISHNAN, Scientist, both of Central Electrochemical Research Institute, Karaikudi, India, both Indian citizens.

This invention relates to improvements in or relating to Chemical Phosphating of Iron and Steel Surface.

Hitherto it has been proposed to phosphatise the iron and steel surface using formulations based on the foreign patent either by dip or spray or brush phosphating process. These formulations use either zinc phosphate alone or a combination of zinc and manganese phosphate with suitable amount of phosphoric acid with or without addition agents.

This is open to the objection that (i) it is not possible to phosphatise erected structures or similar big steel components in the field by spray or dip process, (ii) both the above process use higher temperatures and accelerators for obtaining reasonable coating weights, (iii) required amount of zinc has to be imported, and (iv) periodic control of the bath is necessary and (v) no known composition is available in India.

The object of this invention is to obviate these disadvantages by using a phosphating formulation based on zinc phosphate or manganese phosphate alone which can be applied to the surface by means of a brush at room temperature.

To these ends, the invention broadly consists in applying the phosphating solution on the surface by means of a suitable brush at room temperature.

The phosphating composition consists of manganese or manganese carbonate, phosphoric acid and suitable filling material based on silicates to bring the solution to brushing viscosity in one case and zinc or zinc salt, phosphoric acid water and suitable filling material in the other case. The surface is washed after 15 to 30 minutes with running water and dried.

The following typical examples are given to illustrate the invention.

#### Example 1 :

Composition	Time	Coating weight
1. Phosphoric acid 2 to 10% v/v	15 to 30 minutes	300 mg. to 1000 mg/sq. ft.
Manganese carbonate 2 to 8%		
Filling material 15-35%		

#### Example 2 :

Composition	Time	Coating weight
Phosphoric acid 2 to 10% v/v	15 to 30 minutes	400 mg. to 1000 mg/sq. ft.
Zinc dust 0.3 to 3.0 %		
Filling material 15 to 35%		

The following are among the main advantages of the invention :—

- (i) The method can be used to phosphatise any erected structure or similar big steel parts which cannot be phosphatised by dip or spray process.
  - (ii) Phosphating can be done at room temperature.
  - (iii) No accelerators are used in the bath.
  - (iv) No periodical control is necessary and can be applied by a layman.
- and
- (v) Although examples have been given using zinc or manganese phosphate, composition given under Example I can be used where import of zinc is to be avoided.

Dated this 8th day of December, 1967.

Sd./-

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Council of Scientific and Industrial  
Research

## COMPLETE SPECIFICATION

### IMPROVEMENTS IN OR RELATING TO CHEMICAL PHOSPHATING OF IRON AND STEEL SURFACE

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).

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

This is an invention by BHAGAVATHI SATHIANANDHAM, Junior Scientific Assistant and KRISHNASWAMY BALAKRISHNAN, Scientist, both of Central Electrochemical Research Institute, Karaikudi, India, both Indian citizens.

This invention relates to improvements in or relating to chemical phosphating of iron and steel surface.

Hitherto it has been proposed to phosphatise the iron and steel surface using formulations based on zinc or manganese phosphate or both either by dip or spray or brush phosphating process. These formulations use either zinc phosphate alone or a combination of zinc and manganese phosphate with phosphoric acid with or without addition agents.

This is open to the objection that (i) it is not possible to phosphatise erected structures or similar big steel components in the field by spray or dip process, (ii) both the above processes use higher temperatures and accelerators for obtaining reasonable coating weights, (iii) required amount of zinc has to be imported, and (iv) periodic control of the bath is necessary and (v) no known composition is available in India.

The object of this invention is to obviate these disadvantages by using a phosphating formulation based on zinc phosphate or manganese phosphate alone which can be applied to the surface by means of a brush at room temperature.

To these ends, the invention consists of a composition for phosphating iron and steel comprising (i) phosphoric acid and (ii) manganese, manganese salt, zinc or zinc salt wherein (iii) a suitable filling material such as bentonite and kaoline is used to adjust the viscosity of the composition to make it suitable for brush application at room temperature (25° C to 30° C approx.). The phosphating solution is applied on the surface by means of a suitable brush at room temperature.

Thus, the phosphating composition consists of manganese or manganese carbonate, phosphoric acid and suitable filling material based on silicates to bring the solution to brushing viscosity in one case and zinc or zinc salt, phosphoric acid water and suitable filling material in the other case.

The process for the production of phosphate film consists in applying the phosphating composition to erected structures like steel bridges, tanks or other big steel components by brushing. The surface is washed after 15 to 30 minutes with running water and dried.

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The following typical examples are given to illustrate the invention.

#### Example 1 :

Composition	Time	Coating weight
(1) Phosphoric acid 10% v/v Manganese carbonate 8% W/V Kaoline 60 W/v	15 minutes	500 mg./sq. ft.

#### Example 2 :

Composition	Time	Coating weight
Phosphoric acid 2% v/v Zinc dust 3% W/V Kaoline 60% W/v	15 minutes	400 mg./sq. ft.

The following are among the main advantages of the invention :

- (i) the method can be used to phosphatise any erected structure or similar big steel parts which cannot be phosphatised by dip or spray process.
  - (ii) Phosphating can be done at room temperature.
  - (iii) No accelerators are used in the bath.
  - (iv) No periodical control is necessary and can be applied by a layman.
- and
- (v) Although examples have been given using zinc or manganese phosphate, composition given under Example I can be used where import of zinc is to be avoided.

#### WE CLAIM :

1. A composition for phosphating iron and steel comprising (i) phosphoric acid and (ii) manganese, manganese salt, zinc or zinc salt, wherein (iii) a suitable filling material such as bentonite and kaoline is used to adjust the viscosity of the composition to make it suitable for brush application at room temperature (25° C to 30° C approx.).
2. A phosphating composition as claimed in Claim 1 which consists of manganese or manganese carbonate, phosphoric acid and suitable filling material based on silicates to bring the solution to brushing viscosity.
3. A phosphating composition as claimed in Claim 1 which consists of zinc or zinc salt, phosphoric acid water and suitable filling material.
4. A process for the production of phosphate film which consists in applying the phosphating composition as claimed in any of the preceding claims to erected structures like steel bridges, tanks or other big steel components by brushing.
5. A process as claimed in Claim 4 wherein the phosphating composition is applied at room temperature (25° C to 30° C approx.)

Dated this 7th day of October, 1968.

Sd/-

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*Council of Scientific & Industrial Research*