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**Complete Specification No. 152857 dated 27th August, 1980**

**Application and Provisional Specification No. 556/De1/79 dated 4th August, 1979**

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**" IMPROVED HEAT RESISTANT PAINTS FOR STEEL AND LIKE METAL  
STRUCTURES".**

**COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, Rafi Marg,  
New Delhi-110001, 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.**

**PRICE : TWO RUPEES**

This is an invention by SUBBIAH NADAR GURUVIAH and KUMMATTITHIDAL SANTHANAM RAJAGOPALAN, Scientists all from Central Electrochemical Research Institute, Karaikudi 6, and Indian citizens.

This invention relates to improvements in or relating to preparation of Heat Resistant Paint for steel structures.

Hitherto it has been proposed to use Aluminium incorporated in silicon resin for protection of structures at higher temperatures. (200-250°C)

This is open to the objection that these paints do not give adequate protection in the low temperature range (80-100°C) in presence of moisture and other corrosive substances.

The object of the present invention is to obviate the disadvantage by incorporating zinc dust or aluminium powder in Butyl titanate medium so as to obtain a highly protective paint which can give either barrier protection or cathodic protection and barrier protection at lower temperatures as well as at higher temperature.

The main finding of this invention consists in incorporating zinc powder or aluminium powder 66-72% by weight with Butyl Titanate as binder, 14-16% by weight, Dibutyl phthalate 4-6% by weight, ethyl cellulose 1-2% by weight and toluene 5-10% by weight is ground well to form uniform paint which can be applied by brush on metallic structures and dries within 4 hours.

The following typical examples are given to illustrate the invention.

## EXAMPLE I

Zinc dust	72 by weight
Butyl Titanate	14 % "
Ethyl cellulose	1% "
Dibutyl phthalate	4% "
Toluene	9% "

## EXAMPLE II

Aluminium powder	66% by weight
Butyl titanate	15% "
Ethyl cellulose	2% "
Dibutyl phthalate	5% "
Toluene	12% "

The paint prepared by the above method was applied on pickled steel surface and evaluated by tests at high temperature and electrode potential measurements.

It was observed that no brown rust in 30% NaCl solution immersion tests at 70-80°C for 20 days. Zinc dust paint gives sufficient negative potential when immersed in sodium chloride solution for 30 days. The coated panels were kept in a furnace at 200°C for 20 days and weighed before and after experiment. The loss in weight of coating was negligible. The protection offered by the paint is superior to other conventional paints.

## ADVANTAGES

The following are the main advantages of this invention:

1. High stability to thermal degradation upto 200°C and at the same time gives better protection even at lower temperature (80-100°C)
2. Zinc dust paint gave cathodic protection to the structure.

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Dated this 24th day of July 1979.

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(ASST. PATENTS OFFICER)

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**COMPLETE SPECIFICATION**  
(Section—10)

**" IMPROVED HEAT RESISTANT PAINTS FOR STEEL AND  
LIKE METAL STRUCTURES".**

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, Rafi Marg,  
New Delhi-110001, 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 :—

152857

This is an invention by Subbiah Nadar Guruviah and Kummattithidal Santhanam Rajagopalan, Scientists all from Central Electrochemical Research Institute, Karaikudi-623006, Tamil Nadu, India and all Indian citizens.

This invention relates to improved process for the preparation of heat resistant paint for steel and like metal structures.

Hitherto it has been proposed to use aluminium incorporated in silicon resin for protection of metal structures at higher temperatures (200-250°C).

This is open to the objection that these paints do not give adequate protection to the said structures at the low temperature range (80-100°C) in presence of moisture and other corrosive substances.

The object of the present invention is to obviate the disadvantage by incorporating zinc dust or aluminium powder in Butyl titanate medium so as to obtain highly protective paints, which can give either cathodic protection or barrier protection or barrier protection at lower temperatures as well as at higher temperatures.

The main finding of this invention is that by incorporating such metal powders like that of zinc or aluminium metals in Butyl Titanate as binder, Dibutyl phthalate, ethyl cellulose and Toluene a paint composition is obtained which can be applied by brush on metallic structures which can be exposed to the air within 4 hours.

The product obtained by this process is a coating composition similar to any paint product in use and is not a mere admixture of ingredients.

The other objective of this invention are to obtain high stability to thermal degradation of coatings upto 200°C and at the same time gives better protection even at lower temperature (80-100°C).

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cathodic protection to the structure and that the same is less costly than silicon base paint.

Accordingly this invention provides a process for the preparation of improved heat resistant paints for steel and like metal structures comprising <sup>admixing</sup> such metal dust/powders as described herein in butyl titanate as binder, ethyl cellulose and dibutyl phthalate and grinding the admixture to uniform brushable consistency with the addition of toluene.

According to a feature of the invention 66 to 72 % by weight of the metal powder is incorporated in 14-16 % by weight of butyl titanate as binder, 1 to 2% by weight of ethyl cellulose and 14 to 16% by weight of dibutyl phthalate, and grinding the admixture to a brushable consistency with addition of 5-12% by weight of toluene.

According to another feature of the invention the metal powder used is of particle size of -300 mesh and the admixing is done by grinding in a ball mill to obtain a paint and adjusting the consistency of same to desired brushable level by addition of 5-10% by weight of toluene.

The incorporation of zinc powder in paint of this invention gives cathodic protection and barrier protection to the metal structures coated therewith against corrosion both at high and low temperature in a range from 80°C the paint obtained by the

process of this invention can be applied by brush on metallic structures and dries in within about 4 hours.

This invention is further illustrated by the following examples of the paint prepared according to this invention.

#### EXAMPLE I

Zinc dust (-300 mesh)	73% by weight
Butyl Titanate	14% "
Ethyl Cellulose	1% "
Dibutyl phthalate	4% "
Toluene	9% "

#### EXAMPLE II

Aluminium Powder (-300 mesh)	66% by weight
Butyl Titanate	15% "
Ethyl Cellulose	2% "
Dibutyl phthalate	8% "
Toluene	12% "

The paint prepared by the above method was applied on pickled steel or like surface and kept for a week and evaluated by tests at high temperature and electrode potential measurements.

It was observed that no brown rust was observed in 30% NaCl solution immersion tests at 70-80°C for 20 days. Zinc dust paint gives sufficient negative potential when immersed in sodium chloride solution for 30 days.



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The commercial paint gave rusting and blistering of paint was observed for the same tests. The coated panels were kept in a furnace at 200°C for 28 days and weighed before and after experiments. The loss in weight of coating was negligible. The protection offered by the paint is superior to other conventional paints.

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We Claim :

1. Process for the preparation of improved heat resistant paints for steel and like metal structures comprising <sup>admixing</sup> such metal dust/ powders as described herein, in butyl titanate as binder, ethyl cellulose and dibutyl phthalate and grinding the admixture to uniform brushable consistency with the addition of toluene.
2. Process as claimed in claim 1 wherein 66 to 72% by weight of the metal powder is incorporated in 14-16% by weight of butyl titanate as binder, 1 to 2% by weight of ethyl cellulose and 14 to 16% by weight of dibutyl phthalate, and grinding the admixture to a brushable consistency with addition of 5-12% by weight of toluene.
3. Process as claimed in claims 1 and 2 wherein the metal powder used is of particle size of -300 mesh and the admixing is done by grinding in a ball mill to obtain a paint and adjusting the consistency of same to desired brushable level by addition of 5-10% by weight of toluene.
4. Process for the preparation of improved heat resistant paint substantially as herein described and illustrated.

Dated this 18th day of August, 1980.

*I.M.S. Mamak*

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PATENTS OFFICER

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