Applicant Name: Tanzila Aslam Logade Total Sheets: 1

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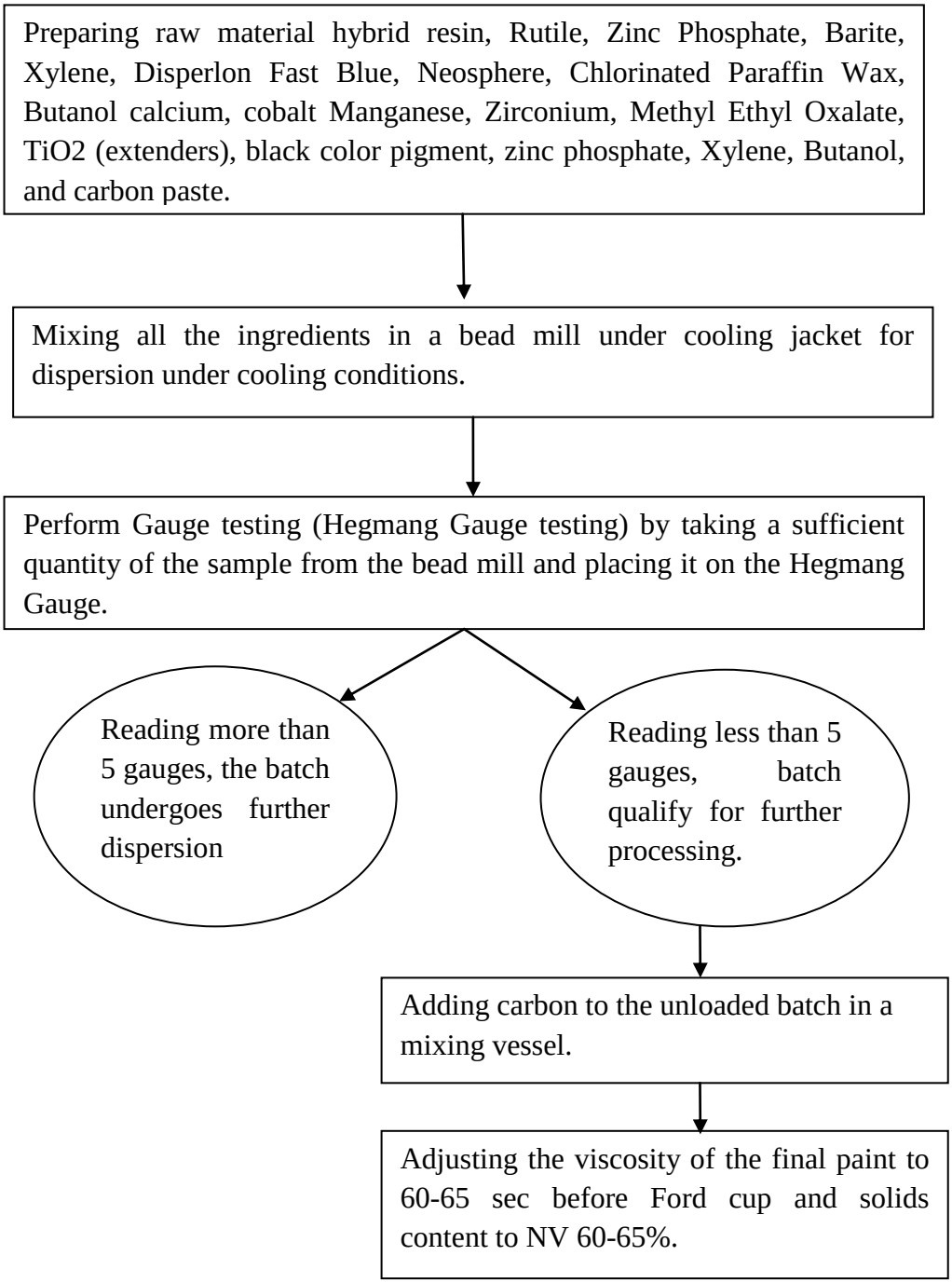


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**IN/PA 2013**
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COMPLETE SPECIFICATION

# CHEMICAL-RESISTANT ANTI-CORROSION SELF PRIMER PAINT COMPOSITION

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The following specification describes the invention and the manner in which it is to be performed.

# CHEMICAL-RESISTANT ANTI-CORROSIVE SELF PRIMER PAINT COMPOSITION

## FIELD OF THE INVENTION

The present invention relates to an anti-corrosive chemical resistant paint composition and more particularly, a coating composition for the protection of metallic structures like Mild Steel (MS), Stainless Steel (SS), Galvanised Iron (GI), copper and Aluminum and non-metallic structures like plastic, glass against corrosion.

## BACKGROUND OF THE INVENTION

Anti-corrosive paint, also known as corrosion-resistant paint, is a type of coating used to protect metal surfaces from rust and other forms of corrosion. These types of paints work by creating a barrier between the metal surface and the environment, preventing water and oxygen from reaching the metal surface and causing rust to form. The first anti-corrosive paints were developed in the early 20th century and have since been used in a variety of industrial and marine applications. Today, there are a wide variety of anti-corrosive paint products available, each formulated with different types of resins, pigments, and other ingredients to provide varying levels of protection against corrosion.

Anti-corrosive paint is a type of coating that is applied to metal surfaces to protect them from corrosion (rusting) caused by exposure to moisture and other environmental factors. These types of paints typically contain corrosion inhibitors that slow down or prevent the chemical reactions that lead to rusting.

Anti-corrosion coatings are typically composed of a combination of ingredients including a binder, pigments, and additives. The binder, often is a type of resin, acts as a glue to hold the coating together and adhere it to the surface being protected. Pigments, such as zinc, provide additional corrosion resistance and can also give the coating a specific colour. Additives, such as inhibitors and catalysts, can be added to improve the performance of the coating in specific

environments. The specific composition of an anti-corrosion coating can vary depending on the intended application and the type of corrosion being protected against.

Chemical resistant paint is a type of paint that is designed to resist corrosion from chemicals, solvents, and other harsh substances. It is often used in industrial, commercial and marine applications where there is exposure to harsh chemicals or corrosive substances. The paint is formulated with special resins and pigments that provide excellent resistance to chemical attack and provide a durable, long-lasting finish.

Earlier a two–pack epoxy system was used for chemical resistance. A two-pack epoxy system is a type of coating that consists of two separate components: an epoxy resin and a hardener. The two components are mixed together immediately before application, and once mixed, the coating begins to cure and harden. This system is known for its excellent durability, chemical resistance, and overall toughness. It is commonly used in industrial and marine environments, such as on ships and offshore oil rigs, as well as in harsh chemical processing plants.

The two-pack epoxy systems require proper mixing and surface preparation before application, and the correct curing conditions should be maintained for the coating to harden properly. However, incubation action of the two-pack epoxy system has its own disadvantages, one of the main disadvantages of a two-pack epoxy system is that it can be difficult and time-consuming to mix and apply the composition. The two components of the coating must be precisely measured and mixed together immediately before application, which can be a labour-intensive process.

Another disadvantage of a two-pack epoxy system is that it can be sensitive to temperature and humidity during application and curing. If the temperature is too low or the humidity is too high, the coating may not cure properly, which can lead to poor performance and reduced durability.

The two-pack epoxy systems can be relatively expensive compared to other types of coatings, and the cost of the raw materials and the equipment required to apply it can be high, UV resistance is also an issue in a two-pack epoxy system.

The present invention recognizes the limitations of prior art and the need for a composition that overcomes these limitations.

Therefore, to solve the above-mentioned shortcomings the present invention discloses an anti–corrosive composition which is self-primer paint and is chemical resistant in nature.

**OBJECT OF THE INVENTION**

Some of the objects of the present disclosure aimed to mitigate one or more problems of the prior art or to at least provide a useful alternative is described herein below:

The primary object of the present invention is to provide an anti-corrosive chemical resistant coating composition which maintains high anti-corrosion activity on metals as well as on non-metal structures.

Another object of the present invention is to provide an anti-corrosion chemical resistant coating composition in which the anti-corrosive potential of the coating on metal and non-metal substances is maintained in an acceptable optimum range and corrosion on these structures can be completely prevented.

Yet another object of the present invention is to provide an anti–corrosion paint composition for metal structures, civil structures, battery manufacturing units, acid manufacturing units, chemical manufacturing units, high chlorides areas, coastal area coating cement and other substrate protective coating and coil coating for fridge, automotive etc.

Still another object of the present invention is to provide an anti-corrosion coating composition having a long shelf-life.

It is a further object of the present invention to provide an anti-corrosion self-primer paint, in this primer before application of the color is not needed.

**SUMMARY OF THE INVENTION**

According to an embodiment of the present invention, the present discloses an anti-corrosive paint composition, which gives extreme chemical resistance to metallic and non metallic surface.

According to the present invention, the anti-corrosion paint composition comprises 100 parts by weight of part A for paint formation and 2 parts by weight of part B for paste formation, wherein the part A comprising 30 to 35 % w/w of hybrid resin, 4 to 5 % w/w of Rutile, 4 to 5 % w/w of Zinc Phosphate, 20 to 22 % w/w of Barite, 30 to 32% w/w of Xylene, 0.50 to 1 % w/w of Disperlon, 0.50 to 0.10 % w/w of Fast Blue, 0.30 to 0.10 w/w of Neosphere, 2 to 3 % w/w of Chlorinated Paraffin Wax, 3 to 4 % w/w of Butanol, 0.10 to 0.20 % w/w of calcium, 0.10 to 0.20 w/w of cobalt, 0.10 to 0.20 % of Manganese, 0.05 to 0.10 % w/w of Zirconium, and 0.05 to 0.10 w/w of Methyl Ethyl Oxalate for paint formation, and wherein, the part B comprising 0.96-0.99% w/w of hybrid resin, and 0.01-0.03% w/w of carbon nanoparticle for paste formation.

The anti-corrosive paint composition of the present invention characterized to acts as self –primer and doesn't require additional primer coating during the application.

Coating compositions in accordance with the present invention may be either a single-phase or a two-phase type and may contain an aqueous medium as a solvent, or organic solvent comprising ketones, alcohols, aromatic compounds, and mixtures thereof. Polymers which may be used includes Alkylated modified resin and TiO2 as extenders.

The method of preparing the anti-corrosive paint composition, comprising the steps of mixing all the ingredients under jacketed cooling conditions. Further, Hybrid resins, extenders (TiO2), and additives are added to the bead mill. Color pigments like black color pigment and zinc phosphate, which is an anti-corrosive

powder, are added with Xylene and Butanol (solvents) to adjust the viscosity of the composition.

After mixing, the resulting batch of the anti-corrosive paint composition undergoes Gauge testing, specifically Hegmang Gauge testing. A sample from the bead mill is taken and placed on the Hegmang Gauge. If the reading is more than 5 gauges, the batch undergoes further dispersion. If the reading is less than 5 gauges, the batch qualifies for the next step of unloading. The batch is then unloaded to the mixing vessel, where carbon paste is added. The viscosity of the final paint is adjusted to 60-65 sec before the Ford cup, and the solids content is adjusted to NV 60-65%. The paint composition is then cooled and packed for commercial use.

Anti-corrosive paint and its preparation method thereof according to a preferred embodiment of the present invention is herein described in the following description and illustrated in the accompanying example.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates a flow chart for the preparation of chemical resistant anti-corrosive self primer paint composition of the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

Anti-corrosive paint and a process for the preparation thereof are herein described with numerous specific details to provide a complete understanding of the invention. However, these specific details are exemplary details and should not be treated as a limitation to the scope of the invention.

Throughout this specification, the word “comprises” or variations such as “comprises or comprising”, will be understood to imply the inclusions of a stated element, integer or step, or group of elements, integers, or steps, but not the exclusions of any other element, integer or step or group of elements, integers, or steps.

According to the present invention, the anti-corrosion paint composition comprises 100 parts by weight of part A for paint formation and 2 parts by weight of part B for paste formation, wherein the part A comprising 30 to 35 % w/w of hybrid resin, 4 to 5 % w/w of Rutile, 4 to 5 % w/w of Zinc Phosphate, 20 to 22 % w/w of Barite, 30 to 32% w/w of Xylene, 0.50 to 1 % w/w of Disperlon, 0.50 to 0.10 % w/w of Fast Blue, 0.50 to 0.10 % w/w of Red Oxide, 0.50 to 0.10 % w/w of Black, 0.30 to 0.10 w/w of Neosphere, 2 to 3 % w/w of Chlorinated Paraffin Wax, 3 to 4 % w/w of Butanol, 0.10 to 0.20 % w/w of calcium, 0.10 to 0.20 w/w of cobalt, 0.10 to 0.20 % of Manganese, 0.05 to 0.10 % w/w of Zirconium, and 0.05 to 0.10 w/w of Methyl Ethyl Oxalate for paint formation, and wherein, the part B comprising 0.96-0.99% w/w of hybrid resin, and 0.01-0.03% w/w of carbon nanoparticle for paste formation.

According to the preferred embodiment of the present invention, the chemical resistant anti-corrosion paint composition comprises 33.47 % w/w of hybrid resin, 4.50 % w/w of Rutile, 4.50 % w/w of Zinc phosphate, 20.27 % w/w of Barite, 30.03 % w/w of Xylene, 0.68 % w/w of Disperlon, 0.01 % w/w of Fast Blue, 0.03 % w/w of Red Oxide, 0.03 % w/w of Black, 0.34 % w/w of Neosphere, 2.03 % w/w of chlorinated paraffin wax, 3.38% w/w of Butanol, 0.19 % w/w of Calcium, 0.19 % w/w of cobalt, 0.19 % of Manganese, 0.06 % w/w of Zirconium, 0.06 % w/w of Methyl Ethyl Oxalate, 0.02 % w/w of CNT Graphene are used for the preparation of Part A, which consists of the Paint formation, and 0.98% w/w of hybrid resin, and 0.02% w/w of carbon nanoparticle are used for the preparation of Part B, which consists of the paste formation.

According to another embodiment of the present invention, the method for preparing the anti-corrosion paint composition comprising the step of mixing 100 parts by weight of part A for paint formation and 2 parts by weight of part B for paste formation. The anti–corrosive coating film according to the present invention is characterized in that it is formed from anti–corrosive pigment-containing polyfunctional resin coating composition described as below.

Furthermore, the corrosion-resistant coating composition of the present invention

is used on the surface of the metal structure, civil structures, battery rooms, acid manufacturing units, and chemical manufacturing units.

According to the present composition, the anti-corrosion paint composition comprises hybrid resin, Rutile, Zinc Phosphate, Barite, Xylene, Disperlon Fast Blue, Neosphere, Chlorinated Paraffin Wax, Butanol calcium, cobalt Manganese, Zirconium, Methyl Ethyl Oxalate which acts as an Anti-Settling Agent.

According to another embodiment of the present invention, Fig. 1 illustrates the method of preparing the anti-corrosive paint composition, the method comprising the steps of mixing all the ingredients under jacketed cooling. Bead mill with cooling jacket, means mixing and dispersion done under cooling. Further, the hybrid resins, extenders – TiO2 and additives are added to the bead mill. During this process color pigments like black color pigment and zinc phosphate which is an anti-corrosive powder are added with Xylene and Butanol, which acts as the solvent and are further added to the mixture to adjust the viscosity of the composition. Finally, the ready batch of the anti–corrosive undergoes Gauge testing, more particularly Hegmang Guage testing wherein a sufficient quantity of sample is taken from the bead mill and placed on Hegmang Guage, where if the reading is more than 5 gauges, the batch undergoes dispersion and if the reading is less than 5 gauge the batch qualifies for the next step of unloading. The batch is unloaded to the mixing vessel, in continuation to this carbon paste is added to the mixing vessel. The viscosity of the final paint is adjusted to 60-65 sec before ford cup and solids of NV 60-65%. With this, the paint composition is cooled and packed for commercial use.

**EXAMPLE**

The following example is put forth so as to provide those of ordinary skill in the art with a complete disclosure and description of how the methods and systems claimed herein are performed and evaluated and are intended to be purely exemplary of the invention and are not intended to limit the scope of what the

inventor regards as their invention.

The two phases (A) and (B) of another anti-corrosive coating composition according to the invention were prepared by separated mixing the substances set forth in phases (A) and (B) respectively, wherein the quantities are expressed in per cent by weight with respect to the total weight.

Phase (A) – Paint formation

| COMPOSITION | PERCENT PART | |
|---|---|---|
| Hybrid resin | 33.47 | Active ingredient |
| Rutile | 4.50 | Extender pigment |
| Zinc phosphate | 4.50 | Enhances paint adhesion |
| Barite | 20.27 | |
| Xylene | 30.03 | |
| Disperlon | 0.68 | Surface additive |
| Fast Blue | 0.01 | Color |
| Red oxide | 0.03 | Color |
| Black | 0.03 | Color |
| Neosphere (Instead of Rhelogy Modified) | 0.34 | Viscosity builder |
| CLP | 2.03 | Chlorinated Paraffin Wax (liquid) |
| Butanol | 3.38 | Solvent |
| Calcium | 0.19 | Dryer |
| Cobalt | 0.19 | Dryer |
| Manganese | 0.19 | Dryer |
| Zirconium | 0.06 | Dryer |
| ASA (Methyl Ethyl Oxalate) | 0.06 | Anti – skimming |

| | | |
|---|---|---|
| | | Agent |
| CNT Graphene | 0.02 | |

Phase (B) – Paste formation

| Composition | PERCENT PART | |
|---|---|---|
| Hybrid resin | 0.98 | |
| Carbon nano particle | 0.01 – 0.03 | Anti – static chemical resistant |

The two phases were admixed at the rate of 100 parts by weight of phase (A) to 2 parts by weight of phase (B). Gauge Testing of the batch material was carried on metal and non – metal surface. The coatings produced employing the foregoing anti-corrosion coating composition according to Example exhibit strong adhesion and an absence of corrosion under conditions of high humidity, attack by salts, bending, and impact.

## CLAIMS

**We claim,**

1. An anti-corrosive chemical resistant paint composition, comprising:

   a) a part A for paint formation wherein, the part A comprising 30-35% w/w of hybrid resin; 4-5% w/w of rutile; 4-5% w/w of zinc phosphate; 20-22% w/w of barite; 30 to 32% w/w of Xylene, 0.50 to 1 % w/w of Disperlon, 0.50 to 0.10 % w/w of Fast Blue, 0.50 to 0.10% w/w of Red Oxide, 0.50 to 0.10% w/w of Black, 0.30 to 0.10 w/w of Neosphere, 2 to 3 % w/w of Chlorinated Paraffin Wax, 3 to 4 % w/w of Butanol, 0.10 to 0.20 % w/w of calcium, 0.10 to 0.20 w/w of cobalt, 0.10 to 0.20 % of Manganese, 0.05 to 0.10 % w/w of Zirconium, and 0.05 to 0.10 % w/w of Methyl Ethyl Oxalate; and

   b) part B for paste formation, wherein, the part B comprising 0.96-0.99 % w/w of hybrid resin and 0.01-0.03% w/w of carbon nano particles,

   wherein, the part A is present in a ratio of 100 parts by weight to 2 parts by weight of part B.

   wherein, the anti–corrosive paint composition is characterized in that it is formed from anti–corrosive pigment-containing polyfunctional resin coating.

2. The anti-corrosive paint composition, as claimed in claim 1, wherein, the anti-corrosive paint composition further comprises TiO2 as an extender pigment.

3. The anti-corrosive paint composition, as claimed in claim 1, wherein, the anti-corrosion paint composition is self-priming and does not require an additional primer coating during application.

4. The anti-corrosive paint composition, as claimed in claim 1, wherein, the anti-corrosion paint composition exhibit strong adhesion and resistance to corrosion under conditions of high humidity, attack by salts, bending, and impact.

5. A method for preparing an anti-corrosive paint composition comprising the

steps of:

c) mixing all the ingredients of part A for paint formation under jacketed cooling using a bead mill with a cooling jacket;

d) adding hybrid resins of part B, extenders, and additives to the bead mill;

e) adding color pigments, zinc phosphate, Xylene, and Butanol to the mixture to adjust the viscosity of the composition;

f) performing Gauge testing on a sample from the bead mill, wherein if the reading is more than 5 gauges, the batch undergoes dispersion, and if the reading is less than 5 gauges, the batch qualifies for unloading;

g) unloading the batch to a mixing vessel;

h) adding carbon paste of part B to the mixing vessel;

i) adjusting the viscosity of the final paint to 60-65 sec before the Ford cup;

j) cooling the paint composition.

6. The method as claimed in claim 5, wherein, the anti-corrosion paint composition provides chemical resistance for metal structures, civil structures, battery rooms, acid manufacturing units, and chemical manufacturing units.

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## ABSTRACT

**TITLE: CHEMICAL RESISTANT ANTI-CORROSION PAINT COMPOSITION**

A coating composition for the protection of metallic and non-metallic substances including metal structures, civil structures, battery rooms, acid manufacturing units, and chemical manufacturing units against corrosion. The disclosed anti-corrosion coating comprises (a) synthetic resin (b) extenders (c) additive and (d) pigments. This anti–corrosion coating is a self–primer paint and is chemical resistant in nature. The Anti-corrosion paint composition comprises hybrid resin in an amount of 33.47 % w/w of the composition, Rutile in an amount of 4.50 % w/w of the composition, Zinc Phosphate in an amount of 4.50 % w/w of the composition, Barite in an amount of 20.27 % w/w of the composition, Xylene in an amount of 30.03% w/w of the composition, Disperlon in an amount of 0.68 % w/w of the composition, Fast Blue in an amount of 0.01 % w/w of the composition, Red Oxide in an amount of 0.03 % w/w of the composition, Black in an amount of 0.03 % w/w of the composition, Neosphere in an amount of 0.34 % w/w of the composition, Chlorinated Paraffin Wax is an amount of 2.03 % w/w of the composition, Butanol in an amount of 3.38 % w/w of the composition, Calcium in an amount of 0.19 % w/w of the composition, Cobalt in an amount of 0.19 % of the composition, Manganese in an amount of 0.19 % w/w of the composition, Zirconium in an amount of 0.06 % of the composition, CNT Graphene in an amount of 0.02 % w/w of the composition, Methyl Ethyl Oxalate (ASA) in an amount of 0.06 % w/w of the composition for paint formation and hybrid resin, and carbon nanoparticle for paste formation.