Powder application

One of the important products of deeper zinc processing is zinc powder. Zinc powder (dust) is a fine bluish-gray powder, almost pure zinc (95-98%) with a small amount of impurities.

Consumption of zinc powder.

Zinc powder is a fairly versatile product that has many areas of application.

Zinc dust is introduced into protective paintwork materials (primers and paints), for painting ships, bridges and other structures operating in harsh atmospheric conditions. Coatings containing a mixture of zinc powder and zinc oxide have good anti-corrosion properties.

Paradoxically, when zinc itself is obtained by a hydrometallurgical method, zinc powder is used to purify the zinc sulfate solution from copper and cadmium.

Zinc powder is used in the chemical industry as a filler, in the production of fluoroplastic and other polymers, and lubricants.

In pyrotechnics, zinc powder is used to obtain a blue flame.

Zinc powder is used in rechargeable batteries.

Zinc powder is used in the production of rare and noble metals. In particular, zinc powder displaces gold and silver from cyanide solutions. Without zinc powder, it would not have been possible to extract precious metals from a number of ore materials.

Zinc powder is widely used for diffusion galvanizing in bridge construction, shipbuilding, aircraft construction, and the motor transport industry; in construction for galvanizing metal structures; in the oil refining industry; in the manufacture of anticorrosive compounds, zinc-rich mixtures; secondary processing of metals, as one of the main components in the pharmaceutical industry, chemical - for the production of benzidine and its analogs and for the production of thionic dyes, the solution obtained in the determination of the insoluble residue must be colorless.

The two most promising fields of application of zinc powder in the field of metal protection against corrosion, which are developing most actively, are zinc-rich paints and thermal diffusion zinc plating.

c Zinc coatings provide the longest (up to 25-50 years) protection of steel against corrosion. However, their application to large-sized metal structures by such methods as hot-dip galvanizing or electrochemical deposition is technically difficult to implement and is not used in practice. In comparison with traditional methods, the most accessible, cheapest, and sometimes the only possible method is cold galvanizing.

Cold galvanizing is the application of a special zinc-containing composition to a prepared surface using the methods used for conventional paints, as a result of which a coating is formed that has the same anti-corrosion properties as a coating obtained by the hot-dip galvanizing method.

The use of zinc-rich paints and varnishes (TsNM) containing zinc powder as a pigment is one of the generally recognized methods of protecting metal structures from corrosion in the atmosphere, water, and a number of other media.

ZNM make it possible to realize the unique protective properties of zinc where the use of traditional methods of galvanizing is practically impossible, for example, for large-sized structures, during repair work, at a construction site, in the absence of a production base necessary for galvanizing.

The main advantage of CNM-based coatings containing 85-95 wt% metallic zinc consists in the combination of the properties of anti-corrosion coatings of two classes: zinc, obtained by traditional methods, and paint and varnish. Due to this, zinc-rich coatings (ZNP) protect steel by two mechanisms - protective (cathodic) and barrier, which qualitatively increases its efficiency and duration. Consequently, the use of TsNM can be considered as a special protection technology called "cold galvanizing".

The use of the cold galvanizing method is effective both for obtaining self-coating and preliminary priming, and for interoperative steel protection and repair of previously galvanized surfaces. The method has a number of undeniable advantages over hot-dip galvanizing:

1. there are no restrictions on the size of zinc-coated surfaces;

2. surface preparation can be done on site;

3. structures coated with cold galvanizing compounds are easy to weld;

4. Weld seams can be galvanized on site;

5. damaged (during transportation and installation) areas of the zinc coating are easy to repair;

6. galvanizing is carried out in a wide range of temperatures: from –20 to +40 ° С;

7. Dismantling, transportation to the galvanizing site and back and subsequent installation of structures are not required;

8. it is possible to obtain an elastic coating that can withstand both mechanical deformation and thermal expansion and contraction in a wide temperature range;

9. the degree of adhesion to the galvanized surface of other paintwork materials, incl. powder

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