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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 13913-2008

Replacing GB/T 13913-1992

**Metallic coatings -- Autocatalytic (Electroless)
nickel-phosphorus alloy coatings -- Specification and test
methods**

金属覆盖层 化学镀镍-磷合金镀层 规范和试验方法

(English Translation)

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1 Scope

This standard specifies all requirements and test methods involving electroless nickel-phosphorus plating from aqueous solutions to metallic substrates.

This standard does not apply to electroless nickel-boron alloy coatings, nickel-phosphorus composite coatings and ternary alloy coatings.

Warning. Use of this standard may involve dangerous goods, operations and equipment. However, this standard does not specifically point out relevant issues that may occur in its application.

Regarding safety issues. It is up to the user of this standard to determine the appropriate safety and health measures and to establish the limits to which they may be subject to regulatory restrictions before use.

Behavior.

2 Normative reference documents

The provisions in the following documents become provisions of this standard through reference in this standard. For dated references, all subsequent Amendments (excluding corrigendum content) or revised versions do not apply to this standard. However, parties who reach an agreement based on this standard are encouraged to study Whether the latest versions of these files are available. For undated referenced documents, the latest edition applies to this standard.

3 Terms and definitions

The terms and definitions established in GB/T 3138, GB/T 12334, GB/T 19349, and GB/T 19350 apply to this standard.

4.1 Necessary information

When the ordered workpiece needs to be plated in accordance with the requirements of this standard, the purchaser shall use the contract as a written form in the engineering drawing, purchaser's purchase order and details.

The detailed production schedule provides the following information for all important items.

- a) Coating name (see Chapter 5).
- b) Tensile strength of the part and any heat treatment requirements before and after coating deposition (see 6.2, 6.9, 6.10, 6.11, 6.12 and the appendix A).
- c) Detailing of the major surfaces with appropriate markings on drawings or specimens.

- d) The nature, condition and surface roughness of the base metal, if any of these factors will affect the serviceability or Appearance (see 6.2).
- e) The location, type and size of defects, such as creases, allowed defects (see 6.2).
- f) Surface roughness requirements, such as bright, dull, glossy or other surface roughness requirements, and provide the expected surface roughness as much as possible sample. Remember that samples that have been tested for surface roughness will lose their effectiveness over time and will therefore need to be replaced regularly sample.
- g) any requirements for the underlying layer (see 6.17).
- h) Sampling methods, acceptance criteria or other inspection requirements. If it differs from the requirements already given in GB/T 12609 (see Chapter 7).
- i) Standard methods for testing thickness, hardness, bonding strength, porosity, corrosion resistance, wear resistance and weldability (see 6.4, 6.5, 6.6, 6.7, 6.8, 6.13, 6.14 and Appendix B) and special test conditions (see 6.1).
- j) Any special requirements for treatments that produce compressive stress, such as shot peening before plating (see 6.16).
- k) Special requirements for pretreatment or limited pretreatment.
 - 1) Special requirements for heat treatment or restrictions on heat treatment.
- m) Special requirements for maximum coating thickness, especially for parts that are worn or over-processed. Whether before parts are plated or the thickness is measured after plating, and these requirements must be strictly followed.
- n) Special requirements for coating (plating) layers on electroless nickel-phosphorus plating.

4.2 Supplementary information

The following supplementary information shall be specified by the purchaser.

- a) Steel parts should be demagnetized (demagnetized) before plating to minimize the entry of magnetic particles or iron filings into the coating;
- b) Final surface roughness of the coating (see 6.3);
- c) Any special requirements for the chemical composition of the coating (see 6.15);
- d) Any special requirements for the repair of non-conforming products;
- e) Any other special requirements.

5.1 Overview

Base metal, coating and heat treatment conditions should be noted on engineering drawings, purchase orders, contracts or product schedules. The identification should be in the following order Conduct. base metal, special alloy (optional), internal stress relief requirements, thickness and type of bottom layer, phosphorus content in electroless nickel-phosphorus plating and coating thickness, the type and thickness of the coating (plating) layer applied on the electroless nickel-phosphorus plating layer and post-treatment (including heat treatment). Double slash (/) Will be used to indicate that a step or operation is not listed or omitted.

The logo includes the following.

- a) The term "electroless nickel-phosphorus plating";
- b) National standard number, namely. GB/T 13913;
- c) hyphen;
- d) Chemical symbol of the base metal (see 5.2);
- e) Slash separator (/);
- f) Symbols for electroless nickel-phosphorus plating (see 5.4), and symbols for coatings before and after electroless nickel-phosphorus plating (see 5.4), plating sequence each level in is separated by delimiters in order of operations. The marking of the coating should include the thickness of the coating (μm) and heat treatment requirements (See 5.3).

5.2 Identification of base metal

The base metal should be identified by its chemical symbol or, in the case of an alloy, by its main composition.

For special alloys, it is recommended to identify them by their standard names. For example. fill in the steel number or corresponding national standard in the symbol. like Fe<16Mn>is the national standard naming for low alloy high strength steel.

NOTE: In order to ensure proper surface preparation and therefore bonding between coating and substrate, it is extremely important to determine the specific alloy and its metallurgical state.
important.

5.3 Identification of heat treatment requirements

Heat treatment requirements shall be marked in square brackets as follows.

- a) SR means stress-relieving heat treatment;
- HT means heat treatment to increase the hardness of the coating or the bonding force