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Continuously electrolytically zinc/zinc-nickel alloy coated steel sheet and strip

连续电镀锌、锌镍合金镀层钢板及钢带

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Continuously electrolytically zinc/zinc-nickel alloy coated steel sheet and strip

1 Scope

This Standard specifies the terms and definitions, designation expression method, classification and code, size, shape, weight, technical requirements, test methods, inspection rules, packaging, marks and quality certificates for continuously electrolytically zinc/zinc-nickel alloy coated steel sheet and strip.

This Standard is applicable to electrolytically zinc/zinc-nickel alloy coated steel sheet and strip used in automobiles, home appliances, electronics and other industries (hereinafter referred to as steel sheet and strip).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 247, *General rule of package mark and certification for steel plates (sheets) and strips*

GB/T 708, *Dimension, Shape, Weight, and Tolerance for Cold-Rolled Steel Plates*

GB/T 1839-2008, *Test method for gravimetric determination of the mass per unit area of galvanized coatings on steel products*

GB/T 5213, *Cold rolled low carbon steel sheet and strip*

GB/T 8170, *Rules of rounding off for numerical values & expression and judgement of limiting values*

GB/T 10125, *Corrosion tests in artificial atmospheres - Salt spray tests*

GB/T 17505, *Steel and steel products - General technical delivery requirements*

GB/T 20564 (all parts), *Continuously cold rolled high strength steel sheet and*

strip for automobile

GB/T 39130, *Measuring method for adhesion of zinc coating for galvanized products*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 electrolytic zinc coating; ZE

a coating that is composed of pure zinc and produced by continuous electrolytically zinc production line through electroplating; the coating does not contain any trace elements that are harmful to the bonding force of the binder or the paint performance

3.2 electrolytic zinc-nickel coating; ZN

a coating that is composed of zinc-nickel alloy and produced by continuous electrolytically zinc production line through electroplating; the mass fraction of nickel in the coating ranges from about 8%~15%, and the rest is zinc

3.3 anti-fingerprint treatment

conduct electrolytic passivation treatment on the surface of steel sheet and strip and apply with anti-fingerprint film, so as to improve the stain resistance of electronic or electrical products

4 Designation expression method, classification and code

4.1 Designation expression method

The designation of steel sheet and strip is composed of two parts: substrate designation and coating type. They are connected with "+" in the middle.

Example 1: DC01+ZE, DC01+ZN

DC01 - substrate designation;

ZE, ZN - coating type: pure zinc coating, zinc-nickel alloy coating.

Example 2: CR180BH+ZE, CR180BH+ZN

CR180BH - substrate designation;

6.2 The size, shape and allowable deviation of steel sheet and strip shall meet the requirements of GB/T 708.

6.3 The steel sheet is usually delivered according to the theoretical weight and can also be delivered according to the actual weight. See Annex A for the calculation method of theoretical weight. Steel strip is usually delivered according to actual weight.

7 Technical requirements

7.1 Substrate

Steel sheet and strip can use products in GB/T 5213, GB/T 20564 (all parts) as substrates. According to the negotiation between the supplier and the purchaser, products other than the above-mentioned standards can also be used as the substrate.

7.2 Chemical composition

The chemical composition of steel sheet and strip shall meet the requirements of the corresponding substrate.

7.3 Smelting method

Steel shall be smelted by oxygen converter or electric furnace. Unless otherwise specified, the smelting method is chosen by the supplier.

7.4 Mechanical and technological properties

7.4.1 For pure zinc-coated steel sheet and strip using GB/T 5213, GB/T 20564 (all parts) as the substrate, the mechanical and technological properties shall meet the requirements of the corresponding substrate.

7.4.2 For zinc-nickel alloy coated steel sheet and strip that use GB/T 5213, GB/T 20564 (all parts) as the substrate, for the mechanical properties, if the sum of the double-sided coating weight is less than 50g/m^2, the elongation after fracture is allowed to be reduced by 2% (absolute value) from the specified value of the corresponding substrate, the r value is allowed to be lower than the specified value of the corresponding substrate by 0.2. If the sum of the double-sided coating weight is not less than 50g/m^2, the elongation after fracture is allowed to be 3% lower than the specified value of the corresponding substrate (absolute value), the r value is allowed to be lower than the specified value of the corresponding substrate by 0.3. Other mechanical properties and process properties shall meet the requirements of the corresponding substrate.

7.4.3 For electro-galvanized, zinc-nickel alloy coated steel sheet and strip on

procedures that require coating treatments such as phosphating and electrophoresis, it is not recommended to choose chromic acid passivation and fingerprint resistance treatment.

7.8.2 Chromic acid passivation (C), trivalent chromium passivation (C3) and chromium-free passivation (CN)

The surface treatment can reduce the white rust or black rust on the surface of the product during transportation and storage. When using chromic acid passivation treatment, there is a risk of rubbing black spots on the surface. During trivalent chromium passivation treatment, it shall restrict the hexavalent chromium component in the passivation film that is harmful to human health. During the chromium-free passivation treatment, the passivation film does not contain chromium and chromium ions.

7.8.3 Chromic acid passivation + oiling (CO), trivalent chromium passivation + oiling (CO3) and chromium-free passivation + oiling (CON)

The surface treatment can further reduce the white rust or black rust on the surface of the product during transportation and storage. During trivalent chromium passivation treatment, it shall restrict the hexavalent chromium component in the passivation film that is harmful to human health. During the chromium-free passivation treatment, the passivation film does not contain chromium and chromium ions.

7.8.4 Phosphating (including sealing treatment) (PC), phosphating (including trivalent chromium sealing) (PC3) and phosphating (including chromium-free sealing) (PC5)

This surface treatment prepares the surface for further painting of the steel plate and plays a certain role in lubrication. At the same time, it can reduce the white rust or black rust on the surface of the product. When trivalent chromium is sealed, it shall restrict the content of hexavalent chromium which is harmful to human health. During the chromium-free sealing treatment, the passivation film does not contain chromium and chromium ions.

7.8.5 Phosphating (including sealing treatment) + oiling (PCO), phosphating (including trivalent chromium sealing) + oiling (PCO3) and phosphating (including chromium-free sealing) + oiling (PCON)

This surface treatment can reduce white rust or black rust on the surface of the product and can improve the forming performance of the steel sheet. When trivalent chromium is sealed, it shall restrict the content of hexavalent chromium which is harmful to human health. During the chromium-free sealing treatment, the passivation film does not contain chromium and chromium ions.

7.8.6 Phosphating (excluding sealing treatment) (P)

This surface treatment can reduce white rust on the surface of the product.

7.8.7 Phosphating (excluding sealing treatment) + oiling (PO)

This surface treatment can reduce white rust on the surface of the product and improve the forming performance of the steel sheet.

7.8.8 Oiling (O)

This surface treatment can reduce white rust on the surface of the product. Generally, it is not used as rolling oil and stamping lubricant for post-processing.

7.8.9 Anti-fingerprint (AF), trivalent chromium anti-fingerprint (AF3) and chromium-free anti-fingerprint (AFN)

Anti-fingerprint treatment is a special treatment on the surface of the product to prevent fingerprints and other traces from being left when touching the product. It is applicable to the production of electro-galvanized, zinc-nickel coating products for electrical, electronic devices, chassis, movement and other parts. During trivalent chromium anti-fingerprint treatment, it shall restrict the content of hexavalent chromium which is harmful to human health. During chromium-free anti-fingerprint treatment, the passivation film does not contain chromium and chromium ions.

7.8.10 Un-treatment

The un-treatment method is only applicable to the situation where the purchaser clearly stated that no surface treatment shall be carried out when ordering. It shall be indicated in the contract.

NOTE: In this case, steel sheets and strips are more likely to produce white rust and black spots on the surface during transportation and storage. Users shall be cautious when choosing this processing method.

7.9 Corrosion resistance of coating

7.9.1 Agreed by the supplier and the purchaser and indicated in the contract, it may evaluate the corrosion resistance of steel sheets and strips. The test methods, rating standards and acceptance conditions for corrosion resistance evaluation shall be agreed upon when ordering.

7.9.2 Corrosion resistance is generally evaluated by neutral salt spray test. The rating standards and acceptance conditions of the salt spray test results shall be agreed upon by the supplier and the purchaser at the time of ordering.

7.10 Other technical requirements

Other technical requirements such as tensile strain marks shall meet the

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