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**NATIONAL STANDARD OF THE  
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**GB/T 18684-2002**

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**Specifications of zinc/chromate coating**

锌铬涂层 技术条件

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### Foreword

Appendix A and B in this Standard are informative. This Standard was proposed by the China Machinery Industry Federation. This Standard shall be under the jurisdiction of the China Standardization Technology Committee of Metallic and Non-metallic Coatings. The responsible drafting organizations of this Standard. Wuhan Research Institute of Materials Protection, and Nanjing Hongguang Parachute Equipment Factory. The participating drafting organizations of this Standard. Wuhan Yongtaihe Metal Anticorrosion Technology Co., Ltd., and Beijing Yongtaihe Metal Anticorrosion Technology Co., Ltd. The main drafters of this Standard. Wu Yong, Xue Zhongyou, Zhang Weiming, Li Chunyan and Zhang Hongwei. Specifications of Zinc/Chromate coatings

### 1 Scope

GB/T 18684-2002 is the Chinese national standard on specifications of zinc/chromate coating, in the field of manufacturing engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 10 March 2002 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, and has been in force since 1 August 2002. Classification: ICS 25.220.20, CCS A29. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the technical requirements and test methods of zinc/chromate coatings of steel parts and components.

## 2 Normative References

The following normative documents contain the provisions which, through reference in this text, constitute the provisions of this Standard. For the dated reference, the subsequent amendments (excluding corrigendum) or revisions of these publications do not apply. However, the parties who reach an agreement based on this Standard are encouraged to use the latest edition of these documents. For undated references, the latest edition of the normative document referred to applies.

GB/T 5270-1985 Metallic Coatings on Metallic Substrates - Electrodeposited and Chemically Deposited Coatings - Review of methods available for testing adhesion (eqv ISO 2819:1980)

GB/T 6462 Metallic and oxide coatings - Measurement of Coating Thickness - Microscopical method (eqv ISO 1463)

GB/T 10125-1997 Corrosion Tests in Artificial Atmospheres - Salt Spray Tests (SS) (eqv ISO 9227:1990)

## 3 Definition

The following definition is applicable to this Standard. Zinc/Chromate coatings Using water-based zinc/chromate coatings to dip-coat, brush-coat or spray onto the surface of steel parts or components, then it is baked to form into the inorganic anticorrosion coating of which the main ingredients are the flake zinc and zinc chromate.

## 4 Classification

The zinc/chromate coatings are divided into 4 classes shown in Table 1 according to the coating quantity and coating thickness.

5 Documents that are required to be supplied to supplier

- a) Number of this Standard;
- b) Required coating class of the workpiece to be coated;
- c) The final heat-treatment temperature of the workpiece to be coated.

## 6 Technical requirements

6.1 Appearance The basic color of zinc/chromate coatings shall be silver gray; it can also be other colors by modifying, such as black, and so on. The zinc/chromate coatings shall be

continuous, without defects such as miss-coating, bubble, peel-off, crackle, mottle and impurity.

6.2 Coating quantity and coating thickness The coating quantity and coating thickness of different classes shall not be lower than the requirements specified in Table 1.

6.3 Adhesion strength The coating must not be peeled off and bottom-exposed, after conducting adhesion strength test for coating according to the method in 8.3. However, it is allow that the adhesive tape is color-change and and is adhered with zinc and aluminum dust granules.

6.5 Water resistant test property For class 3 and 4 coatings, after it is conducted for water resistant test according to the requirements of 8.5, the coating must not be peeled off from the matrix or bottom-exposed. For class 1 and 2 coatings, it is exempted from water resistant test.

## 7 Sampling

7.1 In the same batch of products, it is required to randomly sample 3 samples for each test for experiment. If any sample among which is nonconformance after testing, then it is required to randomly sample another 3 samples to conduct the same test one more time. If there is any sample is still nonconformance, then this batch of products shall be deemed as nonconformance.

7.2 For assembly OR part or component of which the mass of single-part exceeds 150 g, it may cut a part of the workpiece as the sample for testing. In order to avoid the matrix of bare steel at incision impacting the test result, it shall adopt coating, wax or adhesive tape to protect the incision.

## 8 Test methods

8.1 Appearance To inspect with the naked eye under the nature diffused light.

### 8.2 Coating and test

8.3 Adhesion Strength Test Adopt adhesive tape test method to inspect the adhesive strength between zinc/chromate coatings and matrix; the tape test shall be conducted according to the requirements of Clause

1.4 in GB/T 270-1985.

8.4 Salt spray test The salt spray test shall be conducted according to the requirements of Clause

3.2.1 in GB/T 10125-1997.

8.5 Water resistant test Soak the sample into de-ionized water of 40°C ±1°C; continuous

soak for 240h; take out the sample; dry at room temperature; then, conduct the adhesive strength test according to the requirements of 8.3;

8.6 Humid heat test The humid heat test shall be conducted in humid heat test box; the humid heat test box shall be able to adjust and control the temperature and humidity.

## Appendix A

(Informative) Calculation method of coating surface area A.1 Shim bolt (pole) nut A.1.1 Flat shim A.2 Workpiece of complicated shape A.2.1 To calculate by resolving into simple sharp To resolve the surface of workpiece of complicated shape into surfaces of several simple shapes; the surface area of workpiece of complicated shape is equal to the sum of surface areas of several simple shapes. For example.

Note.  $S$  is the surface area of workpiece of complicated shape.  $S_1, S_2, S_3, S_4, S_5, S_6$  and  $S_7$  is the surface area of 7 simple shapes of , , , , and respectively in above figure. A.2.2 To calculate in profile modeling of plotting paper Take a piece of plotting paper of which the area is  $X$  (dm<sup>2</sup>) as standard paper; and weigh its mass as  $b$  (g). In addition, take a piece of plotting paper to model for a surface of coated workpiece. Then weigh the mass of profile modeling paper as  $a$  (g). Calculate the area of profile modeling paper, that is, the surface area  $S$  (dm<sup>2</sup>) of coated workpiece, according to the following formula.