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

GB/T 11346-2018

Replacing GB/T 11346-1989

Radiographic testing for aluminum alloy castings - Defect levels

铝合金铸件射线照相检测 缺陷分级

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Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Personnel requirements
- 5 Film requirements
- 6 Defect classification
- 7 Rating
- 8 Assessment record

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard replaces GB/T 11346-1989 "X-ray photography inspection pinhole (circular) classification of aluminum alloy castings", and GB/T 11346- Compared with 1989, the main technical changes except editorial changes are as follows:

- Revised scope (see Chapter 1, Chapter 1 of the 1989 edition);
- Revised the normative reference document (see Chapter 2, Chapter 2 of the 1989 edition);
- Added terms and definitions (see Chapter 3);
- Revised personnel requirements (see Chapter 4, Chapter 3 of the 1989 edition);
- Increased the requirements for negatives on image quality (see Chapter 5, Chapter 4 of the 1989 edition);
- Increased the classification of defects such as porosity, porosity, shrinkage, etc. (see Chapter 6);
- Revised the rules for the evaluation of negatives (see Chapter 7, Chapter 6 of the 1989 edition);
- Revised the radiographic standard map of defects (see Appendix A,

5.2 of 1989). This standard is proposed and managed by the National Foundry Standardization Technical Committee (SAC/TC54). This standard is drafted by: CRRC Qishuyan Locomotive Vehicle Technology Research Institute Co., Ltd. Participated in the drafting of this standard. Shenyang Foundry Research Institute Co., Ltd., Baoding Lizhong Wheel Manufacturing Co., Ltd., Zhangzhou Jinnuo Industrial Co., Ltd. Company, Anhui

Hengtai Power Technology Co., Ltd., CITIC Daika Co., Ltd., Zhejiang Wanfeng Motorcycle Co., Ltd., Shanghai Pilberg Nonferrous Parts Co., Ltd., Dongguan Yi'an Technology Co., Ltd. The main drafters of this standard. Wan Shengyun, Zheng Xiaokang, Jiang Tianfang, Li Xingjie, Feng Zhijun, Chen Yuxin, Liu Lei, Ma Zhengsong, Sun Chungui, Zhang Wenxian, Zhang Gaowei, Lan Tian, Ala Teng, Liu Jun, Lu Shiping, Liu Jianping, Zhao Haifeng, Li Yangde, Li Weirong. The previous versions of the standards replaced by this standard are.

---GB/T 11346-1989. Radiographic inspection defect classification of aluminum alloy castings

1 Scope

GB/T 11346-2018 is the Chinese national standard on radiographic testing for aluminum alloy castings - defect levels, in the field of metallurgy. 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 13 July 2018 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 August 2018. Classification: ICS 77.040.20, CCS J31. 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 personnel requirements, film requirements, defect classification, grade evaluation of radiographic inspection of aluminum alloy castings (hereinafter referred to as castings). Set and assess records. This standard is applicable to the defect classification of radiographic inspection of aluminum alloy castings with a thickness of not more than 50 mm. This standard does not apply to aluminum alloy die castings. This standard does not apply to the classification of defects such as cracks, insufficient pouring, eccentricity, cold insulation and surface irregularities.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 5611 casting terminology

GB/T 5677 steel casting radiographic inspection

GB/T 9445 Non-destructive testing personnel qualification and certification

GB/T 12604.2 Non-destructive testing term radiographic inspection

3 Terms and definitions

The following terms and definitions as defined in GB/T 5611 and GB/T 12604.2 apply to this document.

3.1 Inclusion foreignmaterials A particle located in or on the surface of the casting that is different from the base metal composition.

Note. Inclusions appear on the film as isolated, irregular or long strips of different film blackness. Including slag, sand, paint layer, oxide, sulfide, silicic acid Salt and so on.

3.2 Stomatal gasholes Hole-like defects formed by gas in the casting.

Note. The stomata appear as round or long strips on the film, with dark spots with smooth edges, present in single or in groups, or throughout the casting. The surface is smooth, mainly Pear-shaped, round and oval. Generally not exposed on the surface of the casting, large holes are often isolated, and small holes appear in groups.

3.3 Pinhole gasporosity The size of the needle is distributed over the cross section of the casting.

Note. The pinholes appear on the backsheet in the form of round or strip black spots distributed throughout the casting.

3.4 Loose shrinkage Very small holes in the slow solidification zone of the casting.

Note. Looseness appears on the film in a localized darker area of localized floc or honeycomb. Distributed between dendrites and dendrites, is a diffuse pore, microscopic Shrinkage and organization of coarse mixing defects reduce the compactness of the casting.

3.5 Shrinkage shrinkagecavity Holes in the casting during the solidification process due to poor shrinkage.

Note. The shrinkage cavities appear in the dendrites, fibers or jagged dark areas on the film. Very irregular shape, rough wall and dendritic crystals, often found in castings The site of the final solidification.

4 Personnel requirements

Personnel performing the assessment of test results shall be qualified and certified according to GB/T 9445 or equivalent standards, and the test phase shall be obtained. Level 2 or higher qualification certificates for industrial categories.

5 Film requirements

The film should meet the requirements of GB/T 5677. The film shall be inspected for

conformity before the evaluation, and the unqualified film shall be re-made.

6 Defect classification

6.1 Common defects in casting ray inspection are pores, pinholes (round), pinholes (long), shrinkage holes, loose, inclusions (high density), inclusions (low density) and so on.

6.2 According to different casting thickness, pores, pinholes (circles), pinholes (long), loose, inclusions (high density), inclusions (low density) The negative reference film is divided into two groups, A and B. The shrinkage defect film is listed in group A, as shown in Table 1.

Note. The thickness of the standard of Group A is 6mm, and the thickness of the standard of Group B is 20mm.

6.3 Each type of defect is divided into 8 levels, and the defective graded film is shown in Appendix A. In Appendix A, the defect reference negatives at all levels are 50mm x 50mm.

7 Rating

7.1 Compare the film to be evaluated with the specified reference film. The areas with the most severe defects on the radiographic film of the casting were taken for evaluation.

7.2 The size of the assessment area is 50mm x 50mm.

7.3 When the defect displayed on the film to be assessed is between two adjacent levels, it is rated according to the severity level.

7.4 The pores, inclusions and shrinkage cavities in the same assessment area shall be rated according to the size, quantity and distribution of defects. The cumulative area of the trap is used to assess the defect level.

8 Assessment record

The assessment record shall include at least the casting drawing number, the film number, the assessment result, the signature of the assessor and the date of assessment. Table