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

GB/T 5677-2018

Replacing GB/T 5677-2007

Castings -- Radiographic testing

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 5677-2007 "Carbon radiographic inspection", compared with GB/T 5677-2007, the main changes are as follows.

- Change the standard name to "casting radiographic inspection";
- Revised the scope of application of the standard, increased the variety of metal materials and various casting processes (see Chapter 1);
- Added terms and definitions (see Chapter 3);
- Modified ordering instructions (see Chapter 4, Chapter 3 of the 2007 edition);
- Increased radiographic grading (see Chapter 5);
- Added general rules (see Chapter 6);
- Added radiographic technology (see Chapter 7);
- Increased film evaluation (see Chapter 8);

--- Added Appendix A, Appendix B, Appendix C, Appendix D and Appendix E.

This standard uses the redrafting method to modify the use of ISO 4993.2015 "steel casting radiographic inspection".

This standard has more structural adjustments than ISO 4993.2015. Appendix A lists this standard and ISO 4993.2015.

The chapter number is compared to the list.

The technical differences between this standard and ISO 4993.2015 and their reasons are as follows.

---About the normative reference documents, this standard has made technical adjustments to adapt to China's technical conditions, adjustments

The situation is reflected in Chapter 2, "Regulatory Citations", and the specific adjustments are as follows.

* Replace ISO 19232.1 and ISO 19232.2 with GB/T 23901.1 and GB/T 23901.2;

* Replace ISO 5576 with GB/T 12604.2;

* Replace ISO 11699-1 and ISO 11699-2 with GB/T 19348.1 and GB/T 19348.2;

* Replace ISO 9712 with GB/T 9445;

* Replace ISO 5580 with GB/T 19802;

* Added 6 additional reference documents;

--- Revised scope, ordering instructions, process documents, maximum area of one transillumination, selection of film and intensifying screen, use of image quality meter;

--- Added some terms and definitions, radiographic grading, equipment and equipment, exposure, exposure curve, film quality, film storage

Stock, film evaluation, test records and reports, Appendix A, Appendix B, Appendix C, Appendix D and Appendix E;

--- Removed the acceptance criteria in ISO 4993.2015.

This standard also made the following editorial changes.

--- Change the standard name to "casting radiographic inspection".

This standard is proposed and managed by the National Foundry Standardization Technical Committee (SAC/TC54).

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1 Scope

This standard specifies the ordering instructions for the inspection of castings by X-ray and gamma radiographic film methods, radiographic grading, general rules, ray

Transillumination technology, film evaluation, test records and reports.

This standard applies to steel, copper and copper alloys, nickel and nickel alloys, aluminum and aluminum alloys, titanium and titanium alloys and castings produced by various casting methods.

The radiographic inspection of the parts can also be used for the radiographic inspection of other metal material castings.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 9445 Non-destructive testing personnel qualification and certification (GB/T 9445-2015, ISO 9712:2012, IDT)

GB/T 11533 standard logarithmic visual acuity chart

GB/T 12604.2 Non-destructive testing term radiographic inspection (GB/T 12604.2-2005, ISO 5576:1997, IDT)

GB 18871 Basic standards for ionizing radiation protection and radiation source safety

Non-destructive testing - Industrial radiographic film - Part 1. Classification of industrial radiographic film systems

(GB/T 19348.1-2014, ISO 11699-1:2008, MOD)

GB/T 19348.2 Non-destructive testing - Industrial radiographic film - Part 2. Controlling film processing by reference method

(GB/T 19348.2-2003, ISO 11699-2:1998, IDT)

GB/T 19802 Minimum requirements for non-destructive testing of industrial radiographic viewing lamps (GB/T 19802-2005, ISO 5580:1985,

IDT)

Non-destructive testing - Radiographic film quality - Part 1 . Determination of image quality index of linear image quality

(GB/T 23901.1-2009, ISO 19232-1.2004, IDT)

GB/T 23901.2 Non-destructive testing - Radiographic image quality - Part 2. Determination of image quality index

(GB/T 23901.2-2009, ISO 19232-2.2004, IDT)

GB/T 23910 Non-destructive testing metal sensitization screen for radiographic inspection

GBZ 98 Health Standards for Radiation Workers

GBZ 117 industrial X-ray inspection radiation protection requirements

GBZ 132 industrial gamma ray detection radiation protection standard

3 Terms and definitions

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

3.1

Nominal thickness nominal thickness

The nominal wall thickness of the base metal, regardless of deviation.

3.2

Transillumination thickness penetrated thickness

The nominal thickness of the base metal in the direction of ray transillumination. In multi-wall transillumination, the penetration thickness is the sum of the nominal thicknesses of the layers of material passing through.

3.3

Workpiece to film distance object-to-film distance

The distance from the surface of the object to be inspected on the source side of the beam to the film along the center line of the beam.

3.4

Ray source size source size

The effective focus size of the source.

3.5

Focal length source-to-film distance