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

GB/T 13298-2015

Replacing GB/T 13298-1991

**Inspection Methods of Microstructure
for Metals**

金属显微组织检验方法

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Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard replaces GB/T 13298-1991 *Inspection Methods of Microstructure for Metals*; compared with GB/T 13298-1991, this Standard mainly has the following technical changes:

- Modify specimen preparation into “specimen preparedness” (see Chapter 3);
- Increase two situations for specimen selection (see 3.1);
- Add the schematic diagram for inspection surface (see 3.2.1);
- Add “band structure rating” for the inspection of longitudinal section parallel to the rolling direction (see 3.2.3);
- Add “specimen mark” (see 3.5);
- Adopt clear “mechanical setting fixture diagram” (see 3.7.2);
- Add the vibration polishing (see 5.5);
- Modify “specimen erosion” into “microstructure display”; add the general (see 6.1), optical method (see 6.2), thermal etching display method (see 6.3.5), anodic film method (see 6.4.2); delete the preparation and precautions of chemical etchants and electrolytic etchants (see 4.1.3 of 1991 Edition);
- Delete “metallographic microscope is divided into desktop-type, vertical-type, horizontal-type” (see 5.2 of 1991 Edition);
- Delete “precautions for protecting lenses when using a microscope” (see 5.5, 1991 Edition);
- Delete “making the shadow photograph on the glass plate clear; if necessary, use focusing magnifier to observe on the ground-glass plate” (see 6.6 of 1991 Edition);
- Microstructure inspection part (see Chapter 7), delete photographing with black-and-white negative film and colour negative film, “black-and-white negative film and photographic paper processing” (see 6.10 of 1991 Edition), and “color negative film and color photographic paper processing” (see 6.11 of 1991 Edition); add microscope illumination mode (see 7.2.1); add image acquisition (see 7.3) and image analysis part (see 7.4).
- Add “on-site metallographic inspection” (see Chapter 8);

--- Change “test records” into “test report” (see Chapter 9 of this Edition, and Chapter 7 of 1991 Edition);

--- Add etchant commonly used for metals (see Appendix A).

This Standard was proposed by China Iron and Steel Association.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Steel (SAC/TC 183).

Drafting organizations of this Standard: Central Iron and Steel Research Institute, China Metallurgical Information and Standardization Institute, Fangda Special Steel Technology Co., Ltd., Daye Special Steel Co., Ltd., Shougang Corporation, and Xingtai Iron and Steel Co., Ltd..

Chief drafting staffs of this Standard: Li Jikang, Zhao Xiaoli, Luan Yan, and Ju Xinhua.

The historical edition replaced by this Standard is as follows:

--- GB/T 13298-1991.

Inspection Methods of Microstructure for Metals

1 Scope

This Standard specifies the specimen preparedness, specimen grinding, specimen polishing, microstructure display, microstructure test, on-site metallographic and test records for the metal microstructure inspection.

This Standard is applicable to the operation method of using metallographic microscope to inspect the metal structure.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

YB/T 4377 Electrolytic Polishing Method of Metallographic Specimen

3 Specimen Preparedness

3.1 Specimen selection

3.1.1 General

To ensure the effectiveness of inspection, the selected metallographic specimen shall represent the researched materials objectively and comprehensively as much as possible. The specimen cutting direction, location, quantity shall be determined by the metal manufacturing method, inspection purpose, relevant standards, and provisions of both parties' agreement.

3.1.2 Routine inspection

In addition to the special provisions in the product standard, it is recommended to select from the position that can represent the characteristics of the materials; the specimen shall contain the complete processing and impact area. For instance, the specimen of steel strip or wire is suitable to cut from the end of the coil; cast specimen shall contain the maximum and minimum segregation zones; heat treatment specimen shall contain complete heat treatment layer; surface treatment specimen shall contain all surface treatment layers; welding specimen shall contain weld seam, heat affected zone, and base metal.