GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 77.040.99
H 24

GB/T 226-2015

Replacing GB/T 226-1991

Test Method for Macrostructure and Defect of Steel by Etching

Issued on: September 11, 2015 **Implemented on: June 1, 2016**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;

Standardization Administration of PRC.

Table of Contents

Forward

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

This Standard replaces GB/T 226-1991 *Test Method for Macrostructure and Defect of Steel by Etching*.

Compared with GB/T 226-1991, this Standard mainly has the following changes:

--- Modifying the provision of specimen cutting method;

--- Modifying the provision of reference dimension from specimen test surface to the cutting surface;

--- Increasing the requirement of specimen test surface roughness after machining;

--- Increasing the dendrite corrosion and cold acid etching method;

--- Modifying and increasing the ingredients, etching time and temperature of partial hot and cold acid etching methods;

--- Increasing the DC electrolytic corrosion method;

--- Increasing the expressing method of test results;

--- Removing the evaluation provision of test results;

--- Increasing the provision on lab environment safety.

This Standard was proposed by China Iron and Steel Industry Association.

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

Drafting organizations of this Standard: Angang Steel Company Limited, Baosteel Special Metals Co., Ltd., China Metallurgical Information and Standardization Institute, Shougang Corporation, Daye Special Steel Co., Ltd., Fushun Special Steel Co., Ltd., Xingtai Iron and Steel Co., Ltd., and Central Iron and Steel Research Institute.

Chief drafting staffs of this Standard: Syu Xiaohong, Guo Xiuli, Luan Yan, Ju Xinhua, Cheng Lijie, Zhang Pengyuan, Wang Xiaofeng, Huang Lei, and Dai Wenke.

The previous versions that are replaced by this Standard are as follows:

--- GB/T 226-1997 and GB/T 226-1991.

Test Method for Macrostructure and Defect of Steel by Etching

1 Scope

This Standard specifies the hot acid etching method, cold acid etching method (including dendrite corrosion method), and .electrolytic etching method, which test the macrostructure and defect of steel.

This Standard is applicable to the acid etching test of the macrostructure and defect of steel. Other material's acid etching test can be implemented as per this Standard.

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 standard.

GB 8978-1996 Integrated Wastewater Discharge Standard

3 Specimen

3.1 Specimen cutting

3.1.1 Specimen cutting position, quantity, and test state shall be implemented as per the provisions of relevant standards, technical conditions, or the mutual agreement. If there are no relevant provisions, take two specimens from the steel material (billet) as per the melting (batch) No., generally, they are cut from the first and last plate (piece) ingot head or from casting head billet or tail billet equivalently.

3.1.2 Specimen shall be cut from the casting billet as per the melting (batch) No. with stable casting and pouring process parameters (e.g. casting speed, and etc.), such method is generally called routine sampling.

3.1.3 The test surface of transverse specimen shall be perpendicular to the extending direction of steel material (billet), while the test surface of longitudinal specimen shall generally pass the longitudinal axis of the steel material (billet), the last machining direction shall be perpendicular to the extending direction of steel

material (billet).

3.2 Specimen machining

3.2.1 Specimen can be cut through hot saw, cold saw, flame cutting, shearing and other methods. The deformation or heat affected zone caused by sampling shall be removed during the specimen machining process.

3.2.2 The reference dimension from the test surface to the cutting surface of specimen:

a) No less than 20mm when cut with hot saw;

b) No less than 10mm when cut with cold saw;

c) No less than 25mm when cut with flam.

3.2.3 After machining, the specimen's test surface roughness R_a shall meet the following requirements:

a) Hot acid etching: R_a ≤1.6μm;

b) Cold acid etching: R_a ≤0.8μm, but dendrite corrosion: machining grinding R_a ≤0.1μm, after grinding, the specimen shall conduct mechanical or manual polishing R_a ≤0.025μm;

c) Electrolytic etching: R_a ≤1.6μm.

3.2.4 The specimen surface is not allowed to exist oil stains or machining wounds, if necessary, remove them in advance.

3.3 Specimen dimension

3.3.1 Specimen thickness is generally about 20mm~30mm.

3.3.2 Length of longitudinal specimen is generally about 1.5 times of edge or diameter.

3.3.3 Test surface dimension of steel plate: generally 250mm long, and the width is the plate width.

3.3.4 Continuous casting slab can take transverse specimen from total cross-section or half cross-section with dimension more than half width; while square billet, round billet, and beam blank can take specimen from the total cross-section.

3.3.5 Other types of specimen dimension shall be implemented as per the provisions of relevant standards, technical conditions, and mutual agreement.

than 1000dpi).

6 Specimen Retention

In order to keep the specimen for certain period, the following methods are recommended to use:

a) Neutralization method: after soaking in 10% aqueous ammonia alcohol solution, brush with hot water, and then dry it;

b) Passivation method: immersing in the concentrate nitric acid for a short period (about 5s), the specimen after passivation shall be brushed with hot water, and then dry it;

c) Coating protection method: paint vanish, plastic film and etc.

7 Lab Environment Safety

Residual waste acid after etching operation shall be treated as per the discharge provision of second pollutant specified in Clause 4.2.1.2 of GB 8978-1996.

8 Test Report

a) Entrust organization;

b) Steel designation;

c) Melting (batch) No.;

d) Specimen No.;

e) Specimen cutting direction;

f) Test method;

g) Test results;

h) Test personnel and report date.

END

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------