JB

MECHANICAL INDUSTRY STANDARD OF

THE PEOPLE'S REPUBLIC OF CHINA

ICS 19.100
N 78
Record No.: 34825-2012

JB/T 8290-2011

Replacing JB/T 8290-1998

Non-destructive Testing Instruments – Magnetic Particle Flaw Detectors

无损检测仪器　磁粉探伤机

Issued on: December 20, 2011 **Implemented on: April 1, 2012**

Issued by: Ministry of Industry and Information Technology of the People's Republic of China

Table of Contents

Foreword

This Standard replaces JB/T 8290-1998 "Magnetic Particle Flaw Detectors".

Compared with JB/T 8290-1998, The main changes of this Standard are as follows:

- The technical requirements and inspection methods for tangential magnetic field strength of magnetic particle flaw detectors were added (4.3.3 and 6.6 of this edition);
- The technical requirements and inspection methods for visible light illumination of magnetic particle flaw detectors were added (4.6 and 6.9.2 of this edition);
- The technical requirements and inspection methods for bypass current of magnetic particle flaw detectors were added (4.3.4 and 6.5 of this edition);
- The technical requirements and inspection methods for safety voltage of magnetic particle flaw detectors were added (4.8.2.4 and 6.7 of this edition);
- The technical requirements and inspection methods for continuity of protective grounding circuit of magnetic particle flaw detectors were added (4.8.2.1 and 6.11 of this edition);
- Quality assurance of magnetic particle flaw detectors was added (Chapter 5 of this edition);
- Chapters 3 and 4 of 1998-edition were deleted.

The national standards of technical requirements and inspection methods that are relevant to this Standard are as follows:

GB 5226.1-2008	Electrical Safety of Machinery - Electrical Equipment of Machines - Part 1: General Requirements;
GB/T 15822.3-2005 / ISO 9934-3:2002	Non-destructive Testing - Magnetic Particle Testing - Part 3: Equipment.

This Standard was proposed by China Machinery Industry Federation.

This Standard shall be under the jurisdiction of the National Technical Committee on Testing Machines of Standardization Administration of China (SAC/TC122).

Chief drafting organization of this Standard: Changchun Research Institute for Mechanical Science Co., Ltd.

Participating drafting organizations of this Standard: Nanjing Dongdian Testing Equipment Co., Ltd., Jiangsu Sheyang Shengjieda Flaw Detection Equipment

Non-destructive Testing Instruments - Magnetic Particle Flaw Detectors

1 Scope

This Standard specifies the technical requirements, inspection methods, inspection rules, marking and packaging of magnetic particle flaw detectors (hereinafter referred to as "flaw detectors").

This Standard is applicable to alternating current, direct current, half-wave rectified and full-wave rectified flaw detectors; it is not applicable to the yoke type magnetic particle flaw detectors.

2 Normative References

The following standards contain provisions which, through reference in this text, constitute the provisions of this Standard. For dated references, the subsequent amendments (excluding corrections) or revisions of these publications do not apply. However, the parties who enter into agreement based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. For undated references, the latest edition of the normative document referred to applies.

GB/T 2611-2007	General Requirements for Testing Machines
GB/T 5097-2005	Non-destructive Testing - Penetrant Testing and Magnetic Particle Testing - Viewing Conditions (ISO 3509:2001, IDT)
GB/T 19001	Quality Management Systems - Requirements (GB/T 19001-2008, ISO 9001:2008, IDT)
GB/T 12604.5-2008	Non-destructive Testing - Terminology - Terms Used in Magnetic Particle Testing
JB/T 6147-2007	Requirements for the Packaging, Packaging Marking and Handling of Testing Machine Products
JB/T 7406.2-1994	Testing Machine Terminology - Non-destructive Test Instrument

3 Terms and Definitions

For the purposes of this Standard, the terms and definitions established in GB/T 12604.5 and JB/T 7406.2 apply.

4 Technical Requirements

4.1 Environmental and Operating Conditions

Flaw detectors shall be able to operate normally under the following conditions:

a) The temperature is within the range of -10°C~40°C;

b) The relative air humidity is not larger than 85%;

c) There is no much dust or flammable or corrosive media around;

d) There is no strong electromagnetic radiation or electromagnetic interference;

e) The fluctuation range of supply voltage is within ±10% of rated voltage.

4.2 Type and Specification

The basic types and specifications of flaw detectors shall be in accordance with those specified in Table 1.

4.3 Magnetizing System

4.3.1 The circumferential magnetizing current and the longitudinal magnetizing ampere turns shall be indicated by indicators and shall be able to be continuously adjusted.

4.3.2 Under the condition of using magnetizing test piece, the relative errors of indicated values of circumferential magnetizing current and longitudinal magnetizing ampere turns shall not be larger than ±10%.

4.3.3 The tangential magnetic field strength at the tested position of magnetizing workpiece of flaw detector shall not be less than 2kA/m.

4.3.4 When the flaw detector is operating at no-load state, the reading of indicator shall be 0.

4.3.5 Flaw detectors should have the function of setting circumferential magnetizing current value and longitudinal magnetizing ampere turns and the current tracking function; and it should be set with undercurrent and overcurrent alarm device.

6 Inspection Methods

6.1 Inspection Conditions

Flaw detectors shall be inspected under the environmental and technical conditions specified in 4.1.

6.2 Appliances Used for Inspection

The appliances used for inspection shall include:

a) Grade-0.5 standard voltmeter, RMS ammeter and DC millivolt-meter;

b) Grade-1 current transformer;

c) Grade-1 diverter;

d) Tesla-meter;

e) Surface thermometer;

f) UV irradiation meter;

g) White light illuminometer;

h) Magnetometer;

i) Magnetizing test piece: φ25 mm×460 mm, T2 red copper;

j) Demagnetizing test piece: φ30mm×300mm, 45 steel, water quenched at 860°C, tempered at 480°C, with Rockwell hardness of 38HRC~42HRC;

k) Insulation testing set;

l) Withstand voltage tester;

m) Protective grounding circuit continuity tester.

6.3 Inspection on Rated Circumferential Magnetizing Current and Rated Longitudinal Magnetizing Ampere Turns

Inspection on rated circumferential magnetizing current and rated longitudinal magnetizing ampere turns may be carried out by one of the following two methods:

a) Use magnetizing test piece; adjust the magnetizing current from low value to high value; observe the indicated values of circumferential magnetizing current and longitudinal magnetizing ampere turns of flaw detector;

6.5 Inspection on Bypass Current

When no workpiece is clamped between the heads of flaw detector and the longitudinal magnetizing coil works at open circuit, the indicated values of circular magnetization and longitudinal magnetization shall meet the requirements of 4.3.4.

6.6 Inspection on Tangential Magnetic Field Strength

According to the requirements of users, use magnetizing workpiece; use tesla-meter to measure the tangential magnetic field strength of the inspected position of magnetizing workpiece. The inspection result shall meet the requirements of 4.3.3.

6.7 Inspection on Safety Voltage of Circular Magnetizing Device and Longitudinal Magnetizing Device

Use standard voltmeter to respectively measure the output voltage of circular magnetizing device and longitudinal magnetizing device when the flaw detector is at operating state. The inspection results shall meet the requirements of 4.8.2.4.

6.8 Inspection on Remanence Induction Strength

Use the specified demagnetizing test piece to demagnetize the magnetized demagnetizing test piece; use magnetometer to measure the remanence induction strength of test piece after being demagnetized; the result shall meet the requirements of 4.7.

6.9 Inspection on Illumination

6.9.1 Inspection on UV irradiance may be carried out by one of the following two methods:

a) Measure the illumination on surface of the inspected workpiece with UV irradiation meter;

b) Inspect according to the requirements of GB/T 5097.

The result shall meet the requirements of 4.6.1. If there is dispute over the measurement result, the inspection shall be carried out again according the method given in a).

6.9.2 Measure the visible light illumination with white light illuminometer; the result shall meet the requirements of 4.6.

6.10 Inspection on Temperature

Use magnetizing test piece; let it work for 4h continuously according to the re-usage rate and magnetizing time specified in 4.8.1.2 or according to the equivalent current calculated by Formula (2); use surface thermometer to measure the temperature at

After transportation bump test, the flaw detector shall undergo overall inspection according to the requirements of this Standard without any repair or maintenance; the inspection result shall meet the requirements of 4.9 in this Standard.

6.15 Visual Inspection

4.3.1, 4.3.5, 4.3.6, 4.4, 4.5 and 4.10 shall be inspected visually.

7 Inspection Rules

7.1 Exit-factory Inspection

7.1.1 Exit-factory inspection items are all the items stated in Chapter 4, with exception of 4.8.1.2 and 4.9.

7.1.2 Before delivery, each flaw detector shall pass the inspection according to the exit-factory inspection items.

7.1.3 The measured data of the main exit-factory inspection items shall be indicated in product certificate.

7.2 Type Inspection

7.2.1 Type inspection items are all the items specified in this Standard.

7.2.2 Type inspection shall be carried out under any one of the following conditions:

a) When carrying out trial manufacture and design appraisal acceptance of new products, or old products are produced by new plant;

b) When there is major change in the structural design, material or process of product which has been put into production formally, and the product performance may be influenced;

c) When the production is resumed after production is shut-downed for long term.

d) When the results of exit-factory inspection differs significantly from those of the last type inspection;

e) When the type inspection is proposed by the national quality supervision agency.

7.3 Judgment Rules

7.3.1 As for exit-factory inspection, each product shall be inspected according to the specified inspection items; the acceptance rate shall reach 100%.

7.3.2 As for type inspection, if the lot size is not larger than 50, two products shall be taken as samples for inspection; this batch of products shall be judged as rejected batch, if one product is unqualified upon inspection. If the lot size is larger than 50, five products shall be taken as samples for inspection; this batch of products shall be judged as rejected batch if two or more products are unqualified upon inspection.

8 Marking and packaging

8.1 Marking

8.1.1 Flaw detectors shall be provided with nameplate, with the content covering:

a) Model;

b) Name;

c) Main parameters;

d) Manufacturing date and No.;

e) Manufacturer's name.

8.1.2 As for the products complying with this Standard, the serial number and name of this Standard shall be indicated on product or in product instructions.

8.2 Packaging

8.2.1 Packages of flaw detectors shall be water-proof, damp-proof and rust-proof composite protective packages.

8.2.2 Packaging of flaw detectors shall meet the requirements of 5.6.1, 5.6.4 and 5.6.6 in JB/T 6147-2007.

8.2.3 The shipping marks and handling graphical marks on packaging box shall meet the requirements of Chapter 6 in JB/T 6147-2007.

_____ END _____

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

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