

ICS 19.100
CCS J 04



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

GB/T 23911-2009

Non-destructive testing - Blocks for penetrant testing

无损检测 渗透检测用试块

Issued on: May 26, 2009

Implemented on: December 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;
Standardization Administration of the PRC**

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Foreword

The standard non-destructive testing by the National Standardization Technical Committee (SAC/TC56) and focal points. This standard was drafted. Shanghai Research Institute of Materials, Shanghai Suzhou US Kodak Co. detection equipment, Ma Yun aircraft factory in Guizhou, Shanghai Laboratory Evaluation City engineering materials applications, the material electromagnetic Equipment Co., Ltd. Shanghai, Shanghai Pan Asia NDT Technology Co., Ltd., Shanghai The material Engineering Materials Testing Limited. The main drafters of this standard. Jinyu Fei, Wang Haifeng, should Rong Fu, Li Li, Mi Zhongyu, Zhao Xiong Shu ice. NDT penetrant testing block

1 Scope

China's national standard for the test blocks used in penetrant testing. It specifies the types, the materials, the manufacture, the artificial defects, the use, the cleaning, the verification and the marking of penetrant testing blocks. Penetrant testing finds surface-breaking discontinuities in any non-porous material by capillary action: a penetrant is applied and drawn into the opening, the excess is removed from the surface, a developer is applied, and the penetrant bleeds back out to give a visible or fluorescent indication far wider than the crack itself. It is the only surface method that works on non-magnetic materials, which is why aerospace, aluminium, stainless and titanium work depends on it. And it is the method most easily rendered useless without anyone noticing. Every step can degrade: the penetrant loses sensitivity as it ages or picks up water, the emulsifier or the wash can strip penetrant out of the flaw rather than off the surface, the developer can be applied too thick or too thin, and the dwell times can be too short or long enough for the penetrant to dry in the crack. None of that produces a warning; it produces clean parts. So the process is checked against blocks with known flaws. The standard covers the two kinds: the panels carrying real controlled cracks, produced by chrome-plating and bending or by thermal shock, on which the sensitivity of a penetrant system is compared and graded; and the panels used to check the washability and the removal step, which is where most of the

sensitivity is lost. It specifies their material and manufacture, the flaw geometry and its verification, and - critically - the cleaning between uses, since a block retaining penetrant from the last test gives an indication that proves nothing. Issued on 26 May 2009 and in force since 1 December 2009.

This standard specifies the penetrant testing block (or penetration test block) classification, technical requirements and test methods. This standard applies to penetration type test and factory inspection test block. This standard can also be ordered as a user acceptance basis. NOTE. This standard applies to the penetration of the test piece does not include GB/T 18851.3 of type 1 and type 2 test block.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 3190 Wrought aluminum and aluminum alloy chemical composition (GB/T 3190-2008,

ISO 209.2007, Aluminiumandalu- miniumaloy-Chemicalcomposition, MOD)

GB/T 4237 hot-rolled stainless steel sheet and strip

GB/T 5231 Wrought copper and copper alloy chemical composition and shape of the product

GB/T 12604.3 Terminology for nondestructive testing penetrant testing (GB/T 12604.3-2005, ISO 12706.2000, IDT)

GB/T 19001 quality management system requirements (GB/T 19001-2008, ISO 9001.2008, IDT)

GB/T 27025 testing and calibration laboratories General requirements (GB/T 27025-2008, ISO / IEC 17025.2005, IDT)

JB/T 7523 NDT penetrant testing materials

3 Terms and Definitions

Terms and definitions GB/T 12604.3 established apply to this standard. Category

4 This standard applies penetration test block shall be classified as follows:

a) A test block (aluminum alloy quenching cracks reference blocks);

- b) B-type test block (chrome crack radiation reference blocks);
- c) C-type test pieces (nickel chrome crack cross reference block).

5.1 A test block

5.1.1 shapes and sizes The shape and size of the A-type test block shown in Figure 1.

5.1.2 Materials A test block material should be used LY12 aluminum alloy sheet or the like, and its chemical composition should be consistent with the provisions of GB/T 3190's.

5.1.3 production requirements The aluminum alloy sheet is processed into the shape and dimensions shown in Figure 1, the length of the orientation of the test piece should be consistent with the sheet rolling direction. One side of the test piece is processed into a surface roughness of $R_{Ra} = 1.2\mu\text{m} \sim 2.5\mu\text{m}$. The $R_{Ra} = 1.2\mu\text{m} \sim 2.5\mu\text{m}$ side of the intermediate portion with a burner or another suitable method is locally heated to a certain temperature