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

GB/T 37400.15-2019

**Heavy machinery general technical specification - Part 15:
Non-destructive testing of steel forgings**

重型机械通用技术条件 第15部分：锻钢件无损探伤

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Foreword

GB/T 37400 "General Technical Conditions for Heavy Machinery" is divided into 16 parts.

- Part 1. Product inspection;
- Part 2. Flame cutting parts;
- Part 3. Welded parts;
- Part 4. Cast iron parts;
- Part 5. Steel castings;
- Part 6. Non-ferrous metal castings;
- Part 7. Repair welding of steel castings;
- Part 8. Forgings;
- Part 9. Machining parts;

- Part 10. Assembly;
- Part 11. piping;
- Part 12. Painting;
- Part 13. Packaging;

1 Scope

Part 15 of China's general technical specification for heavy machinery, covering the non-destructive testing of steel forgings. It specifies the general requirements including the principles for selecting a method, the documentation and the personnel, followed by the ultrasonic and other test requirements. Forgings differ from castings in where their defects are and what they mean. A forging starts as an ingot with its own porosity and segregation, and forging closes much of that up - but it also elongates whatever remains into planar defects lying along the direction of working, which is exactly the orientation that ultrasound scanning from the wrong direction will miss. The critical components of a heavy machine are forgings for this reason: a mill roll, a crankshaft, a press column. And because a forged defect is planar rather than volumetric, it is far more dangerous than a casting's rounded porosity of the same size, which is why the acceptance criteria are stricter.

This part of GB/T 37400 specifies the ultrasonic, magnetic powder and penetration testing methods and quality grades of forged steel parts. This section applies to non-destructive testing of forged steel for heavy machinery.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 5097 Non-destructive testing for penetration testing and magnetic particle testing conditions

GB/T 9445 Non-destructive testing personnel qualification and certification

GB/T 11259 Preparation and verification of steel comparison test blocks for ultrasonic inspection

GB/T 12604.1 Non-destructive testing terminology ultrasonic testing

GB/T 12604.3 Non-destructive testing terminology penetration test

GB/T 12604.5 Non-destructive testing terminology magnetic particle testing

GB/T 15822.1 Non-destructive testing - Magnetic particle testing - Part 1. General

GB/T 15822.2 Non-destructive testing - Magnetic particle testing - Part 2

GB/T 15822.3 Non-destructive testing - Magnetic particle testing - Part 3

GB/T 18851.2 Non-destructive testing - Part 2. Examination of osmotic materials

GB/T 18851.3 Non-destructive testing - Penetration testing - Part 3. Reference test block

GB/T 18851.4 Non-destructive testing - Penetration testing - Part 4. Equipment

GB/T 18851.5 Non-destructive testing - Penetration testing - Part 5. Penetration testing at temperatures above 50 ° C

3 Terms and definitions

GB/T 12604.1, GB/T 12604.3, GB/T 12604.5 and GB/T 20737 and the following terms and definitions apply to This document.

3.1 Non-extended defect reflectors with no measurable size When the probe moves smoothly, the defect echo falls uniformly in all directions, and the defect maximum echo amplitude is greater than or equal to the defect of the initial recording limit. see picture 1.