

ICS 45.060
CCS S 39

TB

**RAILWAY INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

TB/T 1619-2010

**Magnetic particle testing of axle for rolling stock
(English Translation)**

Issued on: December 2, 2010

Implemented on: June 1, 2011

Issued by: Ministry of Railways of People's Republic of China

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Foreword

This Standard was drafted in accordance with the rules in GB/T 1.1-2009.

This Standard replaces TB/T 1619-1998 "Magnetic particle testing of axle for rolling stock". As compared with TB/T 1619-1998, the main changes are as follows.

- MODIFY the requirements for testing personnel (see 4.1 of this version; Clause 4 of 1998 version);
- ADD testing equipment's functional requirements (see 4.2.3 of this version);
- ADD the magnetic suspension contamination measurement (see 4.3 of this version);
- ADD testing environment requirements (see 4.4 of this version);
- ADD the illumination requirements for the observation area during self-fluorescent magnetic particle testing (see 4.4.3 of this version);
- DEFINE that the rolling stock magnetic particle testing can only use fluorescent magnetic particle testing (see 4.5, 5.1 of this version);
- MODIFY the testing sensitivity requirements (see 4.6, Clause 5.2 of 1998 version of this version);

- ADD the daily and quarterly performance inspection requirements for the testing equipment (see 4.6 of this version);
- ADD the inspection rules (see 5 of this version);
- MODIFY the demagnetization requirements (see 6.4 of this version; Clause

7.4 of 1998 version);

- MODIFY and ADD magnetization specification equation (see 4.7 of this version; Clause 6.4 of 1998 version);
- INCLUDE the magnetic particle and magnetic suspension's technical requirements into Appendix A (see Appendix A of this version);
- ADD the magnetic suspension contamination measurement method, which is listed in Appendix B (see Appendix B of this version).

This Standard was proposed by and shall be under the jurisdiction of CSR Qishuyan Institute Co., Ltd.

Magnetic particle testing of axle for rolling stock

1 Scope

This Standard specifies the technical requirements, testing rules, defect evaluation, testing records, etc., of the fluorescent magnetic particle testing for newly made rolling stock axles.

This Standard applies to the use of fluorescent magnetic particle wet continuous method to conduct magnetic particle testing for newly made rolling stock axles; the magnetic particle testing process for the rolling stock axle repair and CRH axle can also refer to 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.

TB/T 2047.1 Technical specification for materials used for non-destructive testing in railway - Part 1. Materials for magnetic particle testing

JB/T 8290 Magnetic particle flaw detectors

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Cracks

It refers to, in the process, the defects caused due to destruction of metal continuity. During magnetic particle testing, it is generally characterized by serrated magnetic marks, irregular pointed shape at both ends, clear contour, AND thick & clear magnetic particle aggregation.

3.2

Hair-lines

- Axle machining parts of reassembly wheel set.

5.4 As for the testing parts, after grinding and machining, it shall be subject to re-testing.

6.2 It is not allowed for the transverse cracks, portrait cracks, or transverse hair-lines existed on the axle surface.

6.3 As for the portrait hair-lines on the axle surface, the allowable limit is as below.

a) Dust board seat AND wheel seat (excluding the inertia fatigue cracking zone which is measured 30mm from the wheel seat rear shoulder to the axle end). the single hair-line length shall not exceed 10 mm; the 2mm ~ 10mm length hair-line within the 3870mm² rectangular area shall not exceed 10, its long side of rectangle area shall not exceed 152mm, AND the single hair-line shall not extend to the axle shoulder.

b) The inertia fatigue cracking zone within 30mm from wheel seat to rear

shoulder. the single hair-line length shall not exceed 5 mm; the 2mm ~ 5mm length hair-line within the 3870mm² rectangular area shall not exceed 10, AND its long side of rectangle area shall not exceed 152mm.

c) Journal. the single portrait hair-line length shall not exceed 25mm, AND the 2mm ~ 25mm length hair-line along the entire journal surface shall be not more than 5.

d) Axle body. the single portrait hair-line length shall not exceed 30mm, AND the 5mm ~ 30mm length hair-line within the 2500mm² rectangular area shall be not more than 15.

e) As for the aforementioned parts, the hair-line within same section shall be not more than 3.

f) At each arc of the axle, it is not allowed to exist hair-line.

g) Along the same longitudinal straight line, as for the non-continuous hair-line which exceeds 5mm of length, its total length shall not exceed 50mm.

h) On each part of axle (except for the arc portion and aforementioned relevant provisions), if the portrait hair-line length is less than 5mm, not

Appendix A

(Normative)

Magnetic particle and magnetic suspension

A.1 Magnetic particle

The fluorescent magnetic performance shall comply with the provisions of TB/T 2047.1.

A.2 Magnetic suspension

A.2.1 Water magnetic suspension

A.2.1.1 USE the mixed solution of water and certain proportion dispersants, anti-foaming liquid, and rust inhibitor OR dedicated carrier liquid as the carrier liquid; the dispersants, anti-foaming liquid, and rust inhibitor, etc., from different manufacturers shall be added based on the proportions in the product