

ICS 45.080
CCS S 30



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

GB/T 47706.1-2026

Rail welding - Part 1: General requirements and test methods

钢轨焊接 第1部分：通用要求和试验方法

(English Translation)

Issued on: May 25, 2026

Implemented on: December 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative References	
3 Terms and Definitions	
4 Rail welding methods	
5 General process for rail welding	
6 Rail welding type test	
6.1 General Rules	
6.2 Non-destructive testing (NDT)	
6.3 Static Bending Test	
6.4 Fatigue Test	
6.5 Macroscopic Inspection	
6.6 Microscopic Examination	
6.7 Hardness Testing	
6.8 Drop Weight Test	
6.9 Fracture Surface Defect Record	
6.10 Inspection Report	
7 Acceptance of welded joints	
7.1 General Rules	
7.2 Acceptance Requirements	
7.3 Straightness Inspection	
7.4 Acceptance Documents	
8 Requirements for welding units/welding personnel/inspection personnel	6.
8.1 Welding Unit	
8.2 Welding and Inspection Personnel	
8.3 Review and Supervision	
Appendix A (Normative) Static Bending Test of Rail Base under Tension	
A.1 Static Bending Test Setup	
A.2 Static bending testing machine and load	
A.3 Test Results and Test Report	
Appendix B (Normative) Static Bending Test of Rail Head under Tension	

B.1 Static bending test setup	
B.2 Static bending test machine and load	
B.3 Test Results and Test Report	
Appendix C (Normative) Three-point bending fatigue test	
C.1 Fatigue Test Setup	
C.2 Fatigue testing machine and load cycle	
C.3 Test Results and Test Report	
Appendix D (Normative) Four-point bending fatigue test	
D.1 Fatigue Test Setup	
D.2 Fatigue testing machine and load cycle	
D.3 Test Results and Test Report	
Appendix E (Normative) Macroscopic Inspection	
Appendix F (Normative) Microscopic Inspection	
Appendix G (Normative) Hardness Testing	
G.1 Hardness Measurement	
G.2 Hardness Data Evaluation	
Appendix H (Normative) Drop Weight Test	
H.1 Overview	
H.2 Drop Weight Test Setup	
H.3 Drop Weight Testing Machine	
H.4 Test Results and Test Report	
Appendix I (Normative) Fracture Surface Defect Record	
Appendix J (Normative) Ultrasonic Testing	
J.1 Overview	
J.2 Inspector	
J.3 Testing Equipment	
J.4 Test Block	
J.5 Detection Sensitivity Calibration and Distance-Amplitude Curve Construction	
J.6 Scanning Method	
J.7 Acceptance Standard	
J.8 Test Report	
Appendix K (Normative) Magnetic Particle Testing	
K.1 Overview	
K.2 Inspectors	
K.3 Testing equipment and accessories	

K.4 Detection Method

K.5 Test Report

Appendix L (Normative) Dye Penetrant Testing

L.1 Overview

L.2 Inspection personnel.

L.3 Permeable materials and accessories

L.4 Detection Method

L.5 Test Report

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 1 of GB/T 47706 "Rail Welding". GB/T 47706 "Rail Welding" has the following parts published.

---Part 1: General Requirements and Test Methods this document modifies and adopts ISO 23300-1:2021 "Railway infrastructure - Rail welding - Part 1: General requirements for rail welding".

Test methods.

The technical differences between this document and ISO 23300-1:2021, and the reasons therefor, are as follows.

- a) The terms and definitions of "railway authorities" and "operators" have been removed to better reflect my country's national conditions;
- b) Requirements for drop hammer tests on welded rail joints have been added (see 6.8) to comply with Chinese application requirements;
- c) The requirements for non-destructive testing have been revised (see 7.2) to better suit my country's national conditions;
- d) The straightness inspection location (see 7.3.1) has been changed to conform to my country's national conditions;
- e) The straightness acceptance standards of Japan and the European Union (see 7.3.2) have been deleted, which is not suitable for my country's national conditions;
- f) The technical requirements for static bending tests under rail tension in Japan and the European Union (see Appendix A) have been removed, which is not suitable for my

country's national conditions;

g) The technical requirements for static bending tests of railhead tension in Japan and the European Union (see Appendix B) have been deleted, which is not suitable for my country's national conditions;

h) Requirements for the loading rate of the static bending testing machine have been added (see Appendix A and Appendix B) to better suit my country's national conditions;

i) The load cycle requirements for fatigue testing have been increased (see Appendix C and Appendix D) to better suit my country's national conditions;

j) The test method for hardness testing has been modified (see Appendix G) to suit my country's national conditions;

k) The requirements for the drop hammer test height of rail welded joints have been changed (see Appendix H) to conform to my country's national conditions;

l) The qualification requirements for nondestructive testing personnel have been increased (see Appendices J to L) to better suit my country's national conditions;

m) The technical requirements for ultrasonic testing, magnetic particle testing, and dye penetrant testing have been revised (see Appendices J to L) to conform to my country's national conditions;

n) Appendix M has been deleted, and the "Straightness Requirements in my country" in Appendix M has been added to 7.3.2.

The following editorial changes have been made to this document.

a) Change the standard title to "Rail Welding Part 1: General Requirements and Test Methods";

b) The description of the static bending test in section 6.3 has been deleted;

c) The overview of Appendix A, "Static Bending Test under Tension at the Rail Bottom," has been deleted;

d) The overview of Appendix B, "Static Bending Test of Rail Head under Tension," has been deleted;

e) The overview of Appendix C, "Three-point bending fatigue test," has been deleted;

f) The overview of Appendix D, "Four-point bending fatigue test", has been removed.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Railway Administration.