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

TB/T 1632.4-2014

**Welding of rails - Part 4: Gas pressure welding
(English Translation)**

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Foreword

TB/T 1632 Welding of rails is divided into four parts.

- Part 1. General specification;
- Part 2. Flash butt welding;
- Part 3. Thermit welding;
- Part 4. Gas pressure welding.

This Part is Part 4 of TB/T 1632.

This Part was drafted in accordance with the provisions given in GB/T 1.1-2009.

This Part replaces TB/T 1632.4-2005 Welding of rails - Part 4. Gas pressure welding. Compared with TB/T 1632.4-2005, the major technical changes are as follows.

- MODIFY the equipment requirements for gas pressure welding (SEE 3.2 in this edition and 3.2 in 2005 edition);
- MODIFY the personnel requirements for gas pressure welding (SEE 3.3 in this edition and 3.3 in 2005 edition);
- MODIFY the process requirements (SEE 3.4 in this edition and 3.4 in

2005 edition);

- ADD the requirements for macroscopic inspection items; ADD the requirements for 1 080MPa rail welded joints (SEE 3.5 in this edition and

3.5 in 2005 edition);

- MODIFY the requirements for hardness of welded joints (SEE 3.5 in this edition and 3.5 in 2005 edition);

- MODIFY the inspection method (SEE Chapter 4 in this edition and Chapter 4 in 2005 edition);

- MODIFY the inspection rules (SEE Chapter 5 in this edition and Chapter

5 in 2005 edition);

- MODIFY the Annex A, Gas pressure welding records of rails (SEE Annex A in this edition and Annex A in 2005 edition);

- MODIFY the Annex B, Records of weld fracture defects (SEE Annex B in this edition).

Welding of rails - Part 4. Gas pressure welding

1 Scope

This Part of TB/T 1632 specifies the requirements, inspection methods and inspection rules for the gas pressure welding of rails.

This Part is applicable to the gas pressure welding of 50 kg/m ~ 75 kg/m new rails.

2 Normative references

The following documents are essential to the application of this document. For dated references, only the editions with the dates indicated are applicable to this document. For undated references, only the latest editions (including all the amendments) are applicable to this document.

GB/T 230.1-2009 Metallic materials - Rockwell hardness test - Part 1. Test

method (scales A, B, C, D, E, F, G, H, K, N, T)

GB/T 231.1-2009 Metallic materials - Brinell hardness test - Part 1. Test method

GB/T 4340.1-2009 Metallic materials - Vickers hardness test - Part 1. Test method

GB/T 6394 Metal - Methods for estimating the average grain size

GB/T 8170 Rules of rounding off for numerical values & expression and judgement of limiting values

GB/T 13298 Inspection methods of microstructure for metals

TB/T 1632.1-2014 Welding of rails - Part 1. General specification

3.1 Welding rail requirements

The rails for gas pressure welding shall meet the requirements of Chapter 4 in TB/T 1632.1-2014.

3.2.1 Automated gas pressure welding equipment shall be adopted in

preference. In the welding process, it shall be able to automatically record the change of parameters such as gas flow, rail-end pressure, etc. over time.

3.2.2 The purity of oxygen used for gas pressure welding of rails shall not be

less than 99.5%, while the purity of acetylene shall not be less than 98%.

3.3 Personnel requirements

Each welding operator shall hold a job training certificate issued by the technical institution approved by the railway authority.

3.4.1 Welding environment requirements. The welding places shall have no

rain or heavy fog, at a temperature of not lower than 0°C. When the temperature is below 0°C, measures of heat preservation shall be taken for the oxygen and acetylene cylinders. Meanwhile, early drying shall be carried out within the range of 400mm on each end face of the rails to be welded. Wind shall not be greater than Level 5. In case of above Level 4, wind shielding measures shall

be taken.

3.4.2 POLISH the end faces of rails prior to welding. The allowable deviation

of the end face inclination shall be 0.2mm. SEE Figure 1.

3.4.3 For the alignment clamping operation of rails, alignment shall be based

on the working edges on the top of the rail and the side of the railhead.

3.4.4 The flame surface of the heater shall be parallel to the end face of the

rail.

3.4.5 The convex shearing process shall be carried out automatically. The

convex shearing process shall not cause damage to the joints and the rail parent metal. After convex shearing, there shall be no macroscopic cracks on or welding slag squeezed into the surfaces. The maximum convex shearing allowance (the height of weld reinforcement after convex shearing) for each part of the joint is as follows. 2mm for railhead; 2.5mm for railhead jaw; 2mm for rail web; 1.5mm for rail flange.

reinforcement of the rail flange shall be under smooth transition. Longitudinal grinding shall be carried out along the rails. It is not allowed to carry out horizontal grinding. There shall be no grinding burn on the rail surfaces.

Misalignment in the vertical and horizontal directions on the non-working faces of the welded joints shall be conducted with longitudinal grinding transition.

3.4.10 An imitation-type grinding machine shall be used to perform shape

finishing on the top surfaces of the rails and the working edges on the sides of the railheads for the welded joints. Shape finishing shall maintain the contour shape of railheads. The length of the shape finishing shall not exceed the limit of 400mm on both sides of the weld center line. Shape finishing shall not cause any mechanical or thermal damages to the welded joints or rails. Shape finishing shall not be used correct the excessive flatness deviation and excessive joint misalignment.