

Continuous Welded Rail Management

Guideline





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Preface

Being a RISSB Guideline, this document contains a collection of informative guidance. It is not normative but informative. It promotes good industry practice for the management of continuous welded rail track, in particular, as one aspect of track stability thus it supports elements of AS 7643 – Railway Infrastructure: Track Stability. It is intended to help support the creation of work instructions, process procedures etc.

Scope

The Guideline Continuous Welded Rail Management includes guidance on the management of rail thermal and other stresses, including guidelines for stress management, welding, repairing, adjustment in straights and curves, creep monitoring and control.

CWR description

CWR definition

Continuous welded rail (CWR) is formed by the welding of shorter sections of rail into a continuous piece. The rail is typically welded using one of the following techniques.

Flash butt

Flash butt welding is most commonly carried out to join rails in a factory environment although there are mobile flash butt welding units in widespread use. As these require track occupation on running lines, it is sometimes not preferred in field situations.

Flash butt welding is based on resistance welding which leads to a good quality of welds which are relatively narrow. Mobile flash butt welding has increased in popularity due to:

- lower capital costs associated with the mobile welding plant;
- improved weld quality, particularly relative to aluminothermic field welding.

Aluminothermic

Aluminothermic welding is still the most common field procedure applied for the welding of rails, and in particular for the installation of rail closures that are required after the removal of defects. The process relies on the exothermic reaction that occurs when a mixture of iron oxide and fine aluminium particles are mixed in a crucible and ignited. As considerable heat is generated by the preheating and aluminothermic processes this means aluminothermic welds are generally much wider than flash butt welds. Aluminothermic welds also rely on the establishment and application of good quality control procedures to minimise the percentage of defective welds produced.

It should be noted that the aluminothermic process exhibits several advantages that are not shared by other welding procedures, including:

• very low capital costs for the necessary equipment;