



AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline: Engineering (Track & Civil)

Category: Specification

# ARTC Straightedge Specification

## ETA-01-02

### Applicability

ARTC Network Wide	✓	Western Jurisdiction	
New South Wales		Victoria	

### Primary Source

First issue
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### Document Status

Version	Date Reviewed	Prepared by	Reviewed by	Endorsed	Approved
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### Amendment Record

Version	Date Reviewed	Clause	Description of Amendment
1.0	29 Sep 06	All	First issue

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# 1 Introduction

This Specification has been prepared by ARTC to define straightedges for use by Welders, Track Maintenance Staff, Managers and Track Auditors as a setup tool, and to assess rail weld geometry against acceptance tolerances.

The straightedges defined by this Specification will be referred to as the ARTC Finishing Straightedge, with a 0.5mm Nib, and the ARTC Setup Straightedge, with a 1.8mm Nib.

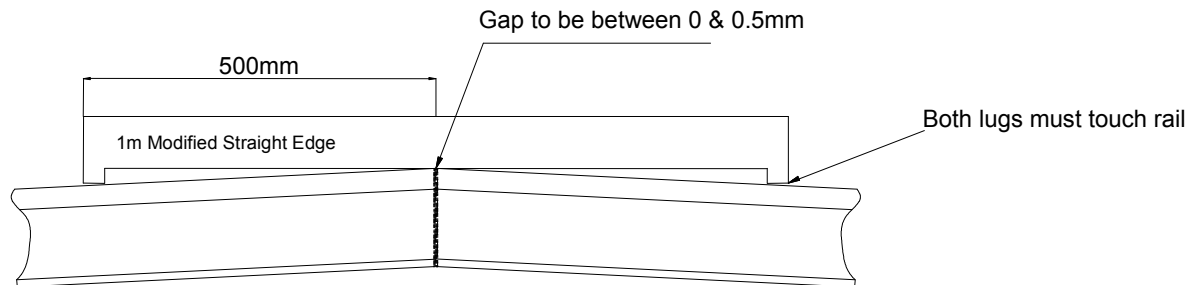
This Specification is for mild steel straight edges that will be used in field and workshop environments where rail welding takes place to achieve tolerances that are defined in Table 1.

Procurement of this equipment is to be arranged through the Procurement Coordinator (Major Track Materials) only.

**Table 1**

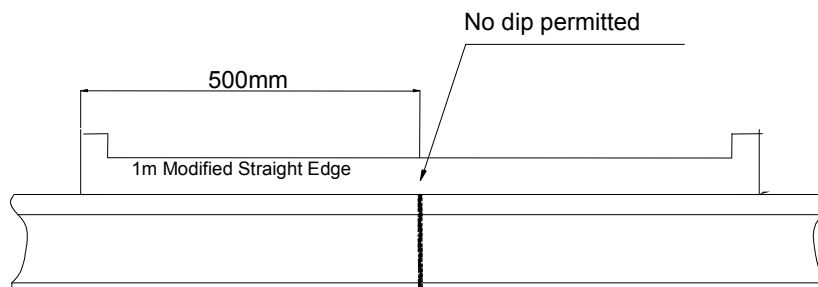
Factor	Standard upon completion
Peak in running surface (maximum)	+0.5 mm over 1 m (0.3 mm preferred)
Dip in running surface	Strictly no dip allowed
Vertical deviation in rail running surface (Slope angle)	7 milliradians over 50 mm base
Gauge widening over 1 m	0.5 mm max (Less preferred)
Gauge narrowing over 1 m	0.5 mm max (Less preferred)

## METHOD OF USE OF ARTC FINISHING STRAIGHTEDGE



Weld does not meet required tolerance in vertical plane (peaking) when both lugs cannot touch rail simultaneously as shown above.

Weld does not meet tolerance in vertical plain if any dip is evident using flat face of the modified straightedge as shown below.



## 2 Scope

This Specification relates to the ARTC Finishing Straightedge, 0.5mm Nib, and the ARTC Setup Straightedge, 1.8mm Nib.

Requirements for dimensional accuracy, materials, quality, finish, marking and packaging and appropriate design features are defined.

## 3 Definitions

### 3.1 Flatness Tolerance

Flatness tolerance is the maximum permissible distance between two imaginary parallel planes which just enclose the surface under consideration.

### 3.2 Squareness Tolerance

Squareness tolerance is the maximum permissible distance between 2 imaginary parallel planes which just enclose the surface under consideration and which are normal to the surface taken as datum.

### 3.3 Parallelism Tolerance

Parallelism tolerance is the maximum permissible variation in the distance separating the surfaces under consideration.

### 3.4 Bearing Surface

The bearing surface is the surface established by higher spots on the surface under consideration.

## 4 Dimensions

The straight edge shall be rectangular in section and 1000mm long (tolerance 0.2mm), 45mm high (tolerance 0.2mm), and 6mm thick (tolerance 0.2mm).

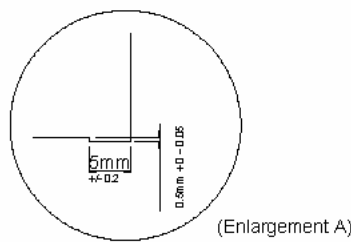
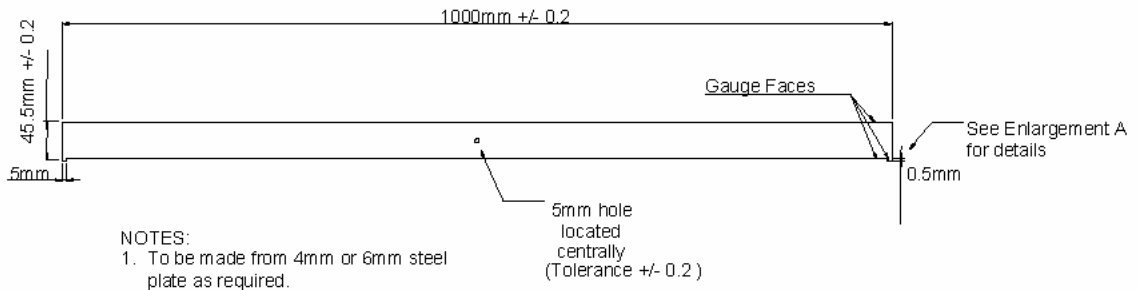
For the Finishing Straightedge a nib 5mm long (tolerance 0.2mm), and 0.5mm high (tolerance +0,-0.05mm), shall be provided at each end of one of the two working edges. The working edges are the opposite thin edges on the longest lengths of the straightedge.

For the Setup Straightedge a nib 5mm long (tolerance 0.2mm), and 1.8mm high (tolerance +0,-0.05mm), shall be provided at each end of one of the two working edges.

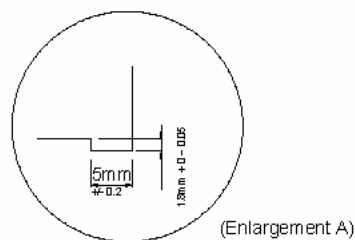
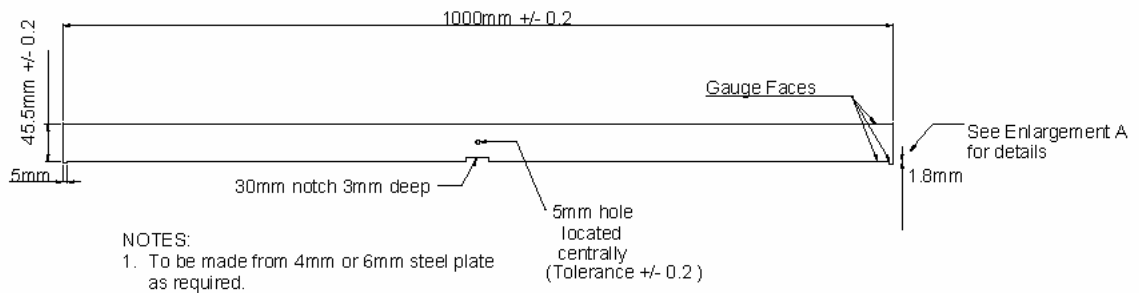
A 5mm diameter hole through the straightedge must be provided centred 500mm from each end of the straightedge and 22.5mm from each working edge of the straightedge, with a tolerance of 0.2mm.

A notch 30mm long and 3mm deep shall be located centrally on the same working edge as the nibs for the Setup Straightedge to enable the straightedge to clear the rail ends.

### ARTC FINISHING STRAIGHTEDGE



### ARTC SETUP STRAIGHTEDGE



## 5 Side Faces and Corners

The side faces and corners of the straight edge must be reasonably straight and flat and square to the working faces, and the side faces must be reasonably parallel. The faces must meet the tolerance requirements of Clause 10.

All sharp edges and corners must be slightly rounded or chamfered.

## 6 Marking

Each straightedge must be legibly and permanently marked as follows.

### Finishing Straightedge

- Manufacturers mark or trademark
- Title "ARTC Finishing Straightedge – 0.5mm Nib"
- Year of Manufacture
- Serial Number

Example Mark: TRADEMARK, ARTC Finishing Straightedge – 0.5mm Nib, 2005, SN 1336

### Setup Straightedge

- Manufacturers mark or trademark
- Title "ARTC Setup Straightedge – 1.8mm Nib"
- Year of Manufacture
- Serial Number

Example Mark: TRADEMARK, ARTC Setup Straightedge – 1.8mm Nib, 2005, SN 2336

## 7 Testing

The straightedges must be tested and certified by the manufacturer for conformity with this Specification in accordance with a testing plan approved by ARTC.

## 8 Protection

- All surfaces that have not been machined must be painted with clear POR Rust Preventative Paint or similar.
- Protection for transport and storage must be provided as follows. All unpainted surfaces must be coated in fine oil or grease in order to reduce the likelihood of corrosion.
- A protective container approved by ARTC must be provided for each straightedge. A protective container may be fabricated from 65mm PVC pipe, capped at both ends with a threaded 65mm cap.

The protective container sides and caps shall be securely lined with carpet off cuts or other approved material to protect the straightedge from damage.

## 9 Material

Straight edges must be made from high quality rolled steel with welded nibs. Steel used must comply with AS 1442, AS 1444, AS 1447, AS/NZS 3679.1 or other approved Standard.

## 10 Finish

The working faces of the straightedge must be finished by grinding or lapping to the following tolerances.

### 10.1 Flatness of Working Surfaces

Flatness of working surfaces must be within a tolerance of 0.05mm.

### 10.2 Flatness of Side Faces

Flatness of side faces must be within 0.2mm.

### 10.3 Squareness of Side Faces

Side faces of the straightedge must be square to the working edges within 0.5mm.

### 10.4 Parallel Working Faces

Working faces on opposite sides of the straightedge must be parallel within 0.5mm.

### 10.5 Parallel Side Faces

Side faces of the straightedge shall be mutually parallel within 0.5mm.