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रैलों की फ्लैश बट वैल्डिंग

Flash Butt Welding of Rails



केमटेक/2019/सि/ एफ़.बी.डब्लू.आर./1.0

CAMTECH/2019/C/FBWR/1.0

फरवरी/FEBRURARY- 2019

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प्राक्कथन

भारतीय रेलवे में, फ्लैश बट (इलेक्ट्रिक प्रतिरोध) वेल्डिंग प्रक्रियाएं वर्तमान में रेल जोड़ों की वेल्डिंग के लिए उपयोग में हैं।

फ्लैश बट वेल्डिंग प्लांट में अच्छी गुणवत्ता वाले वेल्ड का उत्पादन करना होता है। वेल्ड की अच्छी गुणवत्ता प्राप्त करने के लिए रेल की उपयुक्तता की जांच करना, वैल्डिंग के लिये रेल की तैयारी और वेल्डिंग की सही प्रक्रिया का पालन करना आवश्यक है, अतः वेल्डिंग की प्रक्रिया के दौरान अधिक से अधिक ध्यान देना है।

केमटेक द्वारा तैयार की गई इस पुस्तिका में वेल्डिंग निष्पादन की सामान्य प्रक्रिया और वेल्डेड जोड़ों का परिष्करण को विस्तृत किया गया है। यह तकनीकी ज्ञान का एक स्रोत होगा, कि फ्लैश बट वेल्डिंग प्लांट में वेल्डिंग कैसे की जाती है।

मुझे आशा है कि यह पुस्तिका रेलवे में उपरोक्त कार्यो में शामिल सिविल इंजीनियरिंग कर्मियों के लिए मददगार होगी।

केमटेक, ग्वालियर
25 फरवरी, 2019

(डी.के. गुप्ता)
संयुक्त निदेशक/सिविल

FOREWORD

On Indian Railways, Flash Butt (Electric Resistance) Welding processes are presently in use for welding of rail joints.

The Flash Butt Welding Plants have to be produce good quality welds. It is imperative to check suitability of rails to be welded, Preparation of Rails to be welded and Procedure of Welding of Rails to get good quality of weld, so more and more attention is to be paid during process of welding.

This handbook is prepared by CAMTECH to elaborate the general procedure of execution of welding and finishing of welded joints. This will be a source of technical knowledge that how welding is carried out on a flash butt welding plant.

I hope that this handbook will be of significant help to Civil Engineering personnel involved in above work in Railways.

CAMTECH/Gwalior ***(D.K.Gupta)***

25 February, 2018 ***Joint Director/Civil***

भूमिका

भारतीय रेलवे में यातायात में जबरदस्त वृद्धि हुई है, यह प्रवृत्ति भविष्य में भी जारी रहेगी। भारतीय रेल पर ट्रैक की अधिकतर लंबाई को रेल जोड़ों को वेल्डिंग द्वारा जोड़कर लंबी वेल्डेड रेल वेल्डिंग में परिवर्तित किया जा चुका है।

आज की प्रचलित रेल वेल्डिंग प्रक्रियाएँ फ्लैश-बट वेल्डिंग, एलुमिनो थर्मिक वेल्डिंग और गैस प्रेशर वेल्डिंग हैं। उनमें से फ्लैश-बट वेल्डिंग एक विद्युत आधारित बट वेल्डिंग प्रक्रिया है, जिसमें एक मजबूत स्थिति का फोर्ज वेल्ड बनाया जाता है।

यह महसूस किया गया है कि वेल्डिंग की प्रक्रिया के दौरान पर्याप्त सावधानी और निवारक उपाय अपनाए जाने चाहिए। यह पुस्तिका फ्लैश-बट वेल्ड रेल के संयुक्त बनाने के लिए सूचनात्मक तकनीकी विवरण प्रदान करने के उद्देश्य से तैयार की गई है।

यह पुस्तिका वैधानिक नहीं है तथा इसमें दी गई जानकारी का उद्देश्य केवल मार्गदर्शन करना है। पुस्तिका में प्रस्तुत अधिकांश डेटा एवं जानकारी किसी न किसी रूप में उपलब्ध साहित्य, क्षेत्र सर्वेक्षण तथा इंटरनेट खोज पर आधारित है। अधिक गहराई से जानकारी/ज्ञान के लिए, विषय पर उपलब्ध प्रासंगिक विस्तृत साहित्य को संदर्भ रूप में देखा जा सकता है।

हम इस पुस्तिका के आगे सुधार के लिए पाठकों से किसी भी सुझाव का स्वागत करते हैं।

केमटेक, ग्वालियर ***(एस.एस. पाठक)***
25 फरवरी, 2019 ***सीनियर सेक्शन इंजीनियर/पी.वे.***

PREFACE

There have been tremendous enhancements in traffic on the Indian Railways, this trend will continue in future also. The track length on Indian Railways has almost been converted in to Long Welded Rails by joining of rails with welding.

Today's the most common rail welding processes are Flash-butt welding, Alumino Thermic welding and Gas Pressure Welding. Among them Flash-Butt Welding is an electrical based butt welding process in this a solid phase, forge weld is made.

It has been realized that adequate precautions and preventive measures should be adopted during process of welding. This handbook is prepared with the objective to provide informative technical details for making flash-butt weld joint of rails.

This handbook is not statutory and contents are only for the purpose of knowledge dissemination. Most of the data & information in some form or the other are based on literature available, field survey and internet search. For more in-depth information/knowledge, the relevant detailed literature available on the subject may be referred to.

We welcome any suggestions from readers for further improvement of this handbook.

CAMTECH/Gwalior ***(S.S.Pathak)***

25 February, 2018 ***Senior Section Engineer/P.Way***

संसोधन पर्चियों का प्रकाशन/
PUBLICATION OF CORRECTION SLIPS

इस लघु पुस्तिका के लिए भविष्य में जारी की जाने वाली संसोधन पर्चियों को निम्नानुसार संख्याकित किया जायेगा:/ The correction slips to be issued in future for this handbook will be numbered as follows:

केमटेक/सि/2019/एफ़.बी.डब्लू.आर./1.0 सीएस # XX दिनाँक...../ CAMTECH/C/2019/FBWR /1.0/CS. # XX date.....

जहां "XX" सम्बंधित संसोधित पर्ची की क्रम संख्या है (01 से प्रारम्भ होकर)/ Where "XX" is the serial number of the concerned correction slip (starting from 01 onwards).

सुधार पर्चीयाँ जारी की गयीं
CORRECTION SLIPS ISSUED

सुधार पर्ची की क्रम संख्या / Sr. No. of Correction Slip	जारी करने की तारीख / Date of issue	संशोधित पृष्ठ क्रमांक एवं मद संख्या / Page no. and Item No. modified	टिप्पणियाँ Remarks

विषय-सूची/**CONTENTS**

स.क्र. **S.No.**	**विवरण/Description**	**पेज स.** **Page No.**
	प्राक्कथन/Foreword	*i*
	भूमिका/Preface	*ii*
	संशोधन पर्ची/Correction Slip	*iii*
	विषय-सूची/Contents	*iv*
1.0	**परिचय/**Introduction	**1**
2.0	**व्यापकता/**Scope	**1**
3.0	**वेल्ड किए जाने वाली रेल का चयन** Selection of Rails to be Welded	**2**
4.0	**वेल्डिंग के लिए रेल की उपयुक्तता** Suitability of Rails for Welding	**3**
5.0	**वेल्ड किए जाने वाले रेल की तैयारी** Preparation of Rails to be Welded	**9**
6.0	**रेलों की वेल्डिंग की प्रक्रिया** Procedure of Welding of Rails	**10**
7.0	**परिष्करण/** Finishing	**15**
8.0	**वेल्डों का रिकॉर्ड/** Record of Welds	**16**
9.0	**अनुलग्नक/** ANNEXURE – I	**18**
10.0	**टिप्पणी /** NOTES	**20**

1.0 परिचय/Introduction

Flash welding is a type of resistance welding that does not use any filler metals. The pieces of metal to be welded are set apart at a predetermined distance based on material thickness, material composition, and desired properties of the finished weld. Current is applied to the metal, and the gap between the two pieces creates resistance and produces the arc required to melt the metal. Once the pieces of metal reach the proper temperature, they are pressed together, effectively forge welding them together.

2.0 व्यापकता/Scope

I. The book gives details of the types and suitability of rails to be welded by stationary Flash Butt Welding Plant, Mobile Flash Butt Welding Plant.
II. Pre-welding inspection.
III. Preparation of rail ends before welding.
IV. The general procedure of execution of welding and finishing of welded joints.
V. It defines geometrical tolerances for the finished joints and acceptance tests to ensure quality control.
VI. Weld parameters for different rail sections/chemistry have been prescribed by manufacturers and are unique to the particular welding plants. These shall be approved by RDSO. Should any change in these parameters be considered necessary, the same shall be got approved by RDSO.

VII. All welding shall be carried out on a flash butt welding plant using automatic, programmed welding sequence.

3.0 वेल्ड किए जाने वाली रेल का चयन/Selection of Rails to be Welded

3.1 Section of Rails – Capacity of the individual plant will determine the heaviest section and type of rail that can be welded. New as well as released but serviceable rails of same type (section and metallurgy) shall only be welded together.

Welding of rails of different sections metallurgy shall not be attempted. It is preferable that rails rolled by the same manufacturers are welded together. Minimum length of old but serviceable rails for welding shall be 6 meters.

3.2 Welding of Old Rails – While welding old rails, it shall be ensured that only serviceable rails are welded. Old rails to be welded shall preferably be match marked before releasing from track to achieve maximum uniformity of profiles in weld zone.

3.3 Fish-bolt Holes – Welded panels (10/20 rails) for laying long welded rails shall, as far as possible, be without fish-bolt holes. If drilling of fish-bolt hole is necessitated for the purpose of handling during end unloading; only the second fish-bolt hole (one away from the rail end) need be drilled. In case, welding of

new rails with fish-bolt holes cannot be avoided, it shall be ensured that the outer edge of the hole nearest to the rail end is at least 40 mm away from the end to be welded to avoid the heat affected zone of the weld extending up to the edge of the hole.

All fish-bolt holes shall be chamfered before welding.

3.3.1 Ends of old rail with fish-bolt holes/bond wire holes shall be cropped by a minimum length of 450mm before welding.

3.4 Ultrasonic Testing of Rails to be welded – New and old but serviceable rails shall be free from internal defects. In the case of new rails, the ultrasonic testing is required to be done at the rail manufacturer's premises. Old but serviceable rails shall invariably be tested ultrasonically before they are taken to Flash Butt Welding Plants.

4.0 वेल्डिंग के लिए रेल की उपयुक्तता/Suitability of Rails for Welding

4.1 Old Rails

4.1.1 Defective rails – Rails having cracks or other defects such as heavy corrosion pits or which are worn by more than 2mm depth at rail seat shall not be welded.

4.1.2 Permissible vertical wear of rails to be welded – The vertical wear in old rails to be welded (measured as per Para 302 (b) (iii) of Indian Railways

Permanent Way Manual) shall be within the limits specified below:-

Rail Section	Standard Height of New Rail	Minimum Height of Worn Rail
60kg	172.00 mm	164 mm
52 kg	156.00 mm	150 mm

4.1.3 Permissible lateral wear of rails to be welded – Old rails to be welded shall preferably show similar pattern of side wear and the minimum width of rail head shall be as specified below:-

Rail Section	Standard width of Head of new rail	Minimum width of Head of old rail
60kg	72.00 mm	66 mm
52 kg	67.00 mm	61 mm

4.1.4 Rails with cyclic wear shall not be welded.

4.2 Difference in Height of Rail Ends to be welded

The individual rail ends for new rails may have a maximum difference in height of 1.2 mm at the welded joints. Rails manufactured by SAIL with dispensations (Having letter 'D' in the rolling mark), may have a maximum difference in height of 1.5mm. The difference in height shall be transposed to the foot of the rail.

4.3 Difference in Width of Rail Heads to be welded

4.3.1 The difference in the width of rail heads of two rails to be welded shall not exceed 1.0 mm for new and 2.0 mm for old rails. New rails manufactured by SAIL with dispensations (having letter 'D' in the rolling mark) may have a maximum difference of 1.5 mm in the width of rail heads.

For new rails, it is preferable to restrict the difference in width of rail heads to 0.5 mm by marking deviation on the rail head so that rails with same or minimum relative deviations are selected for welding

4.3.2 Any difference in the widths of rail heads at the welded ends, in case of both new and old rails, as a result of rolling tolerances in case of new rail and wear in case of old rails, the rail ends shall be aligned in accordance with 3.3.3 and 3.3.4 below.

4.3.3 In case of welding in depot, where it is not possible to determine the gauge face side exactly when laid in track, during setting up of rails, any difference in the width of rail heads at welded ends shall be transposed to one side of the head keeping the other side perfectly aligned. The aligned side of such welded panels shall be distinctly marked with green paint on the web at both ends of the panel. To facilitate pairing of panels, aligning on operator side as well as non-operator side may be resorted to. Resulting step on non gauge face side after welding shall be ground out to slope not steeper than 1:500.

4.3.4 In case of in-situ welding and in case where it is possible to exactly determine gauge face when laid in track, the rail ends shall be perfectly aligned to gauge face. Any step as a result of unequal head width due to rolling tolerances shall be ground out to slope not steeper than 1:500.

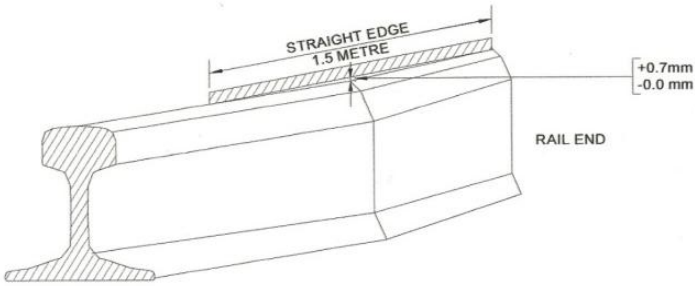
4.4 Rail End Geometry

Rail ends to be welded shall meet following geometrical standards: -

(a) End-bends in the vertical plane not greater than 0.7 mm on a 1.5 metre straight edge 3.4 (a). Sagging ends not permitted.

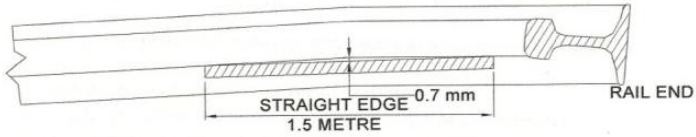
(b) End-bends in the horizontal plane not greater than +0.7 mm on a 1.5 metre straight edge [Figs. 3.4 (b) and (c)].

(c) Deviation of the end from the square not greater than +0.6 mm [Fig. 3.4 (d)].



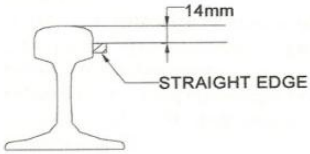
ELEVATION

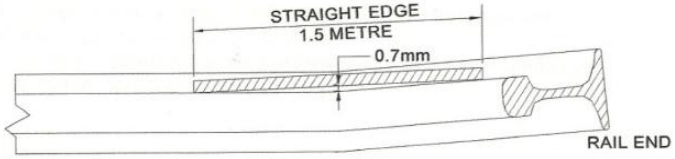
FIG :3.4(a) TOLERANCE ON THE END BENDS IN THE VERTICAL PLANE



PLAN

FIG :3.4(b)





PLAN

FIG : 3.4(c) TOLERANCE ON THE END BENDS IN THE HORIZONTAL PLANE

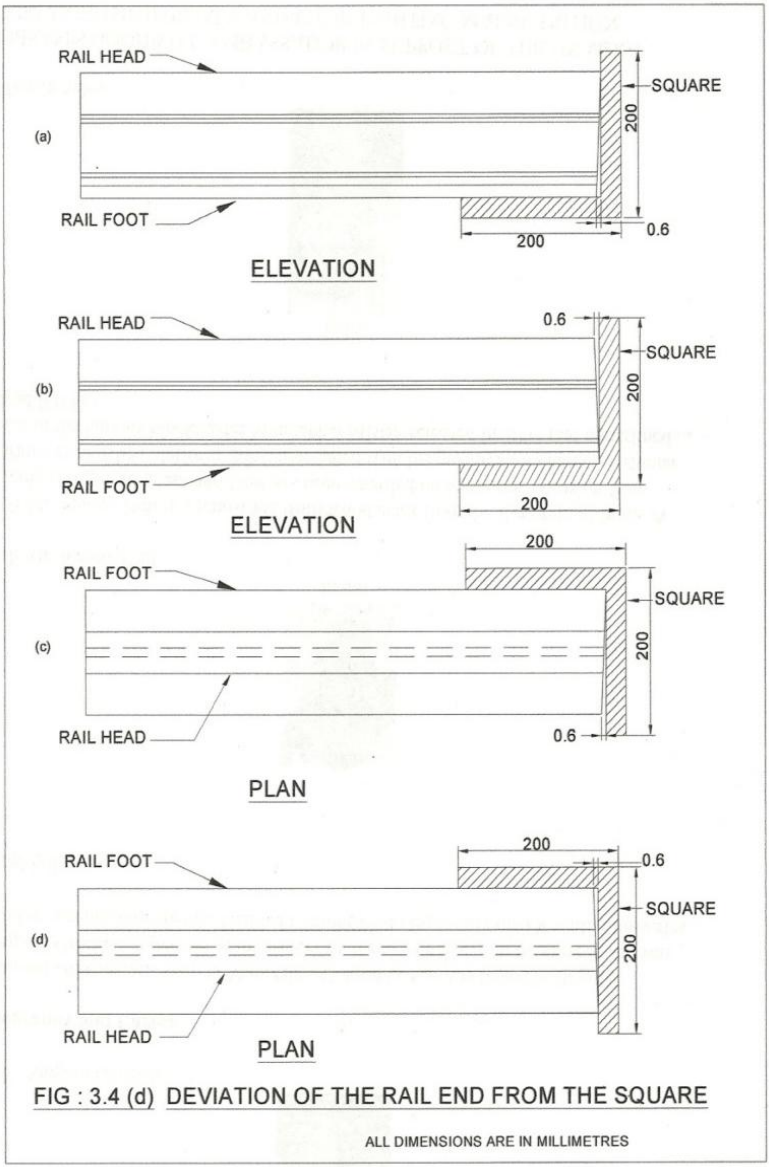


FIG : 3.4 (d) DEVIATION OF THE RAIL END FROM THE SQUARE

ALL DIMENSIONS ARE IN MILLIMETRES

4.5 A thorough inspection shall be carried out at the plants with a view to avoid welding of rails with visible surface defects such as rolling/guide marks, wheel burns etc.

4.5.1 Rail should also be inspected to ensure that there is no chisel mark or dent of any type on bottom flange of the rail as this constitutes the tension zone.

4.6 The rails rejected due to non-compliance of the requirements of Para 3.1 to 3.5 shall not be welded. Such rails shall be marked and stacked separately for other uses.

5.0 वेल्ड किए जाने वाले रेल की तैयारी/Preparation of Rails to be welded

5.1 **Pre-Straightening of Rails –** Rails not meeting the geometrical standards are to be rectified before welding using a pre-straightening machine so as to conform to the standards.

5.2 In order to minimize the difference in head width of rail ends to be welded, actual head width of rails shall be checked using template. The deviations shall be marked on the rail head so that rails with same or minimum relative deviations are selected for welding.

5.3 **Ends Cleaning –** Before welding, end faces of the rails to be welded and electrode contact locations shall be thoroughly cleaned of loose scales, rust, paint

etc. by brushing and shot blasting/grinding to bare metal finish for good electrical contact to avoid arcing at the contact points on the rail and to eliminate the possibility of rail failure near joint due to Copper penetration and formation of brittle martensite structure. Cleaning of rail bottom shall be ensured by placing a mirror and watching the cleaned surface. The electrode contact locations should be marked with chalk on each rail end to be welded to serve as guidance for cleaning. Oil and grease, if present, shall be removed by Carbon Tetrachloride or Benzene. If any internal defect such as piping is noticed during end cleaning, the rail shall not be welded.

6.0 रेलों की वेल्डिंग की प्रक्रिया/Procedure of Welding of Rails

6.1 Electrical Contact – The electrical contacts, i.e. Copper / Melloroy electrode in the welding machine must be cleaned by compressed air pistol to ensure freedom from loose oxides and other foreign matter so that no arcing takes place at the contact points on the rail and to eliminate the possibility of rail failure near joint due to Copper penetration and formation of brittle martensite structure. The electrodes must be replaced and machined whenever surface depressions exceeding 1mm in depth are formed due to wear. For this purpose, adequate spare electrodes should be kept in the plant.

6.2 Rail Alignment

6.2.1 The running surfaces of rails at interface shall be aligned carefully to avoid any 'step' defect generally keeping gauge face corner as reference line.

6.2.2 For the reason of asymmetry, rails should preferably be welded with brand marks on same side.

6.3 Welding Sequence – The Stationary Flash-butt Welding Plants adopt following welding sequence:-

- Aligning (along with de-twisting, if possible).
- Initial burn off.
- Preheating.
- Flashing.
- Forging (upsetting).
- Stripping.

The mobile flash butt welders, however, give continuous flashing instead of initial burn off, preheating and flashing cycles separately.
Air pressure and voltage/current recommended by the manufacturer must be ensured throughout the welding cycle.

6.3.1 Initial burn-off – Relevant to the specifications of rail and welding machine, controls shall be adjusted so that at the end of this phase weld interface has good overall contact.

6.3.2 Preheating – The rail ends are brought into contact to allow a low voltage high amperage current flow which preheats the rail ends. Lower voltages are preferred to minimise crater damage on the rail ends.

The movable rail is alternatively moved backward and forward producing a series of electrical contacts with the fixed rail end. The objective is to heat the rail faces uniformly by flashes up to the red hot stage. The rail ends are brought in and out of contact for certain duration a number of times depending on the specifications of the welding plant, the section and the metallurgy of the rail. This pre-heating cycle is executed in a fully controlled automatic mode once the parameters are selected.

6.3.3 Flashing – Flashing consists of moving the rail in continuous manner initially at a fixed speed but during the last few seconds, at an accelerated rate. The flashing speed is so arranged that the rail ends burn-of f without short circuiting or giving rise to an open circuit condition.

6.3.4 Forging (upsetting) – Immediately following flashing, the pattern movement is accelerated so that the rail ends are butted together to a stage of fusion under a heavy butting force whose magnitude depends on the make of the welding plant. The welding current automatically gets cut off during the later part of the forging operation. The joint should be left undisturbed in clamped position for ten seconds after the welding cycle.

6.3.4.1 The recommended butting pressure for different types of rails is indicated below:-

- *72 UTS rails*: – 5 kg/mm^2 on cross sectional area.

- *90 UTS rails & Head Hardened rails*: – 6 kg/mm^2 on cross sectional areas.
- *110 UTS rails*: – 7 kg/mm^2 on cross sectional area.

The heaviest rail section which can be welded on plant should be decided on this basis.

Welding of higher UTS and higher section rails on low butting load plant by increasing the number of pre-heats causes very pronounced heat affected zone (HAZ) and is detrimental to the service life of the joints.

6.3.5 Stripping

(i) Automatic Stripper – A stripper, which may be integral with the welding plant or installed either just adjacent to welding machine or at 13/26 m distance from it, shall strip the hot upset metal all round the rail section in such a way that minimum grinding is required to achieve final finished profile at weld.

(ii) Manual Removal of Upset Metal – Wherever automatic stripper is not installed, manual chipping using pneumatic chisel may be adopted. Recommended width of flat chisel is 50mm for removal of upset metal from junction of head & web and web & foot of the rail, half round chisel should be used. Care should be taken to ensure that chipping does not create any notches or under cutting.

However, hot upset metal all round the rail shall be stripped.

(iii) Maximum thickness of trimmed upset shall be in accordance with item (v) of Annexure I Part A for welds of new rails and item (v) of Annexure I Part B for welds of old rails.

6.4 Post Weld Heat Treatment – 72 UTS and 90 UTS rails do not require any special post weld heat treatment. However, alloy steel rails of 110 UTS and head hardened rails need post weld heat treatment to ensure variation in hardness within acceptable limits in heat affected zone. The rails being 60 Kg. Cr-Mn alloy steel rails are required to be subjected to controlled post weld cooling treatment, so as to avoid formation of undesirable micro-structure and cracks in weld and HAZ.

6.5 Weld Parameters – Welding parameters will depend on section and metallurgy of rail to be welded. These are normally specified by the manufacturer of the welding plant. Before adoption, the welding parameters shall be got approved from RDSO by following procedure approval for Standardization of Welding Parameters.

6.5.1 Procedure approval shall be carried out by RDSO for each individual machine (no type approval) by testing weld samples produced in accordance with procedure enumerated below.

6.6 Field approval of welding procedure – For mobile flash butt welding plant having obtained procedure approval, approval for field welding shall be granted after execution of 30 welds on track (carried out in two shifts), if they satisfy the weld acceptance criteria defined below,

a) Visual Inspection – All welds and rails shall be inspected visually for welding, trimming, clamping or profile finish imperfections, such as tears, cavities, cracks, damage and thermal damage, in particular, in the electrical contact areas.

b) Dimensional check – Finished weld samples shall be checked for weld geometry and shall conform to tolerance laid down in Para 8 and Annexure-I

7.0 परिष्करण/Finishing

7.1 The top, side and bottom surfaces of the rail head shall be ground smooth so that the weld surface is absolutely flush with the parent rail surfaces. Particular care is necessary to ensure that finish grinding does not burn or notch the rail surfaces.

After grinding, the top table and the sides of the rail head shall comply with the geometrical standards given in Annexure I.

Grinding shall be done preferably using a profile grinding trolley, in the absence of which manual

grinding can be done using a cup grinder. Depending upon whether it is done mechanically or manually, grinding may be done in stages.

7.2 **Areas to be ground smooth –** Upper sides, under surfaces and edges of rail foot shall be ground smooth. The edges of foot should be rounded and bottom of rail foot ground smooth without any minus tolerances to avoid damage to elastic rail pads and eliminate stress riser.

7.3 In case of in-situ welding with mobile flash butt welding plant, profile grinding can be done in stages i.e. initial grinding and final grinding. Final grinding can be performed in track with rails fastened in position over a minimum length of three sleepers on either side of weld. Profile finishing of rail head shall be carried out and contained in shortest possible length but not greater than 400 mm on either side of weld. Profile finishing should not cause any thermal or mechanical damage to rail.

8.0 वेल्डों का रिकॉर्ड/Record of Welds

Record of all the joints shall be maintained in a register as per proforma as mentioned below.

1. Date of welding
2. Shift (day/night)
3. Joint No.
4. Length of rail

5. Section of rail
6. Welding current (primary, amps)
7. Primary voltage (volts)
8. Clamping pressure Kg/cm2
9. Butting pressure Kg/cm2
10. No. of pre-heats
11. Pre-heating time on…….. . Off……..
12. Burn off time (sec.)
13. Flashing time (sec.)
14. Post welding heat treatment if any
15. Whether automatic weld record chart available
16. Remarks (Any change of voltage during welding etc.)
17. Signature of welder
18. Signature of Foreman

The register shall be signed daily by the welder at the end of the shift and shall be verified and countersigned by the supervisor in-charge. For those welding plants which are equipped with Automatic weld recorder, the chart of the weld recorder shall be analysed every day with respect to voltage, current, upsetting force and platen travel for each weld.

Any parameter not conforming to the standard parameter should be set right. The chart shall also be preserved in addition to the register to facilitate investigations in case of defective joint and joints failing in service.

ANNEXURE – I

Finishing Tolerances for Welds

A. Welds with new rails

(i) **Vertical misalignment:** +0.3 mm to - 0.0 mm at the centre of a 1 m straight edge.

(ii) **Lateral misalignment:** ±0.3mm at the centre of a 1m straight edge.

(iii) **Head finishing (in width):** Side of rail head should be finished to: ± 0.25 mm on gauge side at the centre of 10 cm straight edge.

(iv) **Finishing of top table surface:** + 0.2mm to - 0.0mm at the centre of 10cm straight edge.

(v) **Web zone (under side of head, web, top of base, both fillet each side):** + 3.0 mm to - 0.0 mm of the parent contour.

(vi) Upper sides, under surfaces and edges of rail foot shall be ground smooth. The edges of foot should be rounded and bottom of rail foot ground smooth without any minus tolerances to ensure proper seating on sleepers, unhindered movement of welded panels on end unloading rakes, avoid damage to elastic rail pads and eliminate stress riser.

NOTE: Tolerances for BSP rail rolled as per Explanatory Note to IRST- 12/2009 shall be as under:-

(a) Vertical misalignment: +0.4 mm to –0.0 mm at the centre of 1m straight edge.

(b) Lateral misalignment: ±0.4 mm at the centre of 1m straight edge.

B. Welds with old rails

(i) **Vertical misalignment:** ±0.5mm at the centre of a 1m straight edge.

(ii) **Lateral misalignment:** ±0.5 mm at the centre of a 1m straight edge.

(iii) **Head finishing (on sides):** ±0.3 mm on the gauge side at the centre of a 10 cm straight edge.

(iv) **Head finishing (on top table surface):** ±0.2 mm on the gauge side at the centre of a 10cm straight edge.

(v) **Web zone (under side of head, web, top of base and both fillets on each side):** +3.0 mm to –0.0 mm of parent contour.

(vi) Upper sides, under surfaces and edges of rail foot shall be ground smooth. The edges of foot should be rounded and bottom of rail foot ground smooth without any minus tolerances to ensure proper seating on sleepers, unhindered movement of welded panels on end unloading rakes, avoid damage to elastic rail pads and eliminate stress riser.

(vii) The above tolerances are finished tolerances of welds inclusive of tolerances of rail.

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टिप्पणी / NOTES

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गुणवत्ता नीति

रेलों में यात्री और माल यातायात की बढ़ती मांग को पूरा करने के लिए गुणवत्ता प्रबंध प्रणाली में अनुसंधान, डिजाइनों और मानकों में उत्कृष्टता तथा सतत सुधारों के माध्यम से सांविधिक और नियामक अपेक्षाओं को पूरा करते हुए सुरक्षित, आधुनिक और किफायती रेल प्रौद्योगिकी का विकास करना।

QUALITY POLICY

To develop safe, modern and cost effective Railway technology complying with Statutory and Regulatory requirements, through excellence in Research, Designs & Standards and Continual improvements in Quality Management System to cater to growing demand of passenger and freight traffic on the Railways.

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हमारा उद्देश्य

अनुरक्षण प्रौद्योगिकी और कार्यप्रणाली का उन्नयन करना तथा उत्पादकता और रेलवे की परिसम्पत्ति एवं जनशक्ति के निष्पादन में सुधार करना जिससे अंतर्विषयों में विश्वसनीयता, उपयोगिता और दक्षता प्राप्त की जा सके।

यदि आप इस सन्दर्भ में कोई विचार और सुझाव देना चाहते हैं तो कृपया हमें इस पते पर लिखें :

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OUR OBJECTIVE

To upgrade Maintenance Technologies and Methodologies and achieve improvement in Productivity and Performance of all Railway assets and manpower which inter-alia would cover Reliability, Availability and Utilisation.

If you have any suggestion & any specific comments, please write to us:

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