1 **SCOPE:** This specification covers quenched carbon steel rail splice bars for use in railway track.

**GENERAL REQUIREMENTS**

2 **Design, Dimensions and Tolerances**

The design, dimensions and tolerances shall conform to the pertinent Standard Plan:

<table>
<thead>
<tr>
<th>Standard Plan</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-1201</td>
<td>Rail Splice Bar for 100 lb. A.R.A.-A. Rail</td>
</tr>
<tr>
<td>TS-1202</td>
<td>Rail Splice Bar for 115 lb. R.E. Rail</td>
</tr>
<tr>
<td>TS-1203</td>
<td>Rail Splice Bar for 132 and 136 lb. R.E. Rail</td>
</tr>
<tr>
<td>TS-1204</td>
<td>Bent Splice Bars for 100, 115, 132 and 136 lb. Switches and Spring Frogs</td>
</tr>
</tbody>
</table>

3 **Process**

The steel shall be made by the open hearth, basic oxygen or electric furnace process.

4 **Manufacture**

The bars shall be heated to a suitable temperature, punched, slotted and shaped as required, and quenched in a suitable quenching medium to obtain the required mechanical properties. The heat treating process must have the prior approval of the Railway's Chief Engineer.

**DETAILED REQUIREMENTS**

5 **Chemical Composition**

The steel shall conform to the following requirements as to chemical composition:

<table>
<thead>
<tr>
<th>Element</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>0.35% min. 0.60% max.</td>
</tr>
<tr>
<td>Manganese</td>
<td>- 1.20% max.</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>- 0.04% max.</td>
</tr>
<tr>
<td>Sulphur</td>
<td>- 0.045% max.</td>
</tr>
</tbody>
</table>

6 **Heat Analysis**

A copy of the mill analysis of each heat of steel from which the bars were manufactured shall be submitted to the Railway's Quality Assurance Inspector. These analyses shall conform to the requirements specified in Section 5.

**Note:** Vertical bar at left margin indicates location of latest revision.
7 Check Analysis

The Railway may make check analysis of a splice bar from each heat in the lot or shipment. When requested by the Railway's Quality Assurance Inspector, the manufacturer shall supply drillings from a finished splice bar for check analysis. The composition of the material as determined by the check analysis shall conform to the requirements specified in Section 5, subject to A. I. S. I. Standard Permissible Variations for Check Analysis, otherwise the material shall be rejected.

8 Tensile Requirements

The material shall conform to the following tensile requirements:

- Tensile Strength, psi (MPa) 100,000 (690) min.
- Yield Strength, psi (MPa) 70,000 (485) min.
- Elongation in 2" (50 mm) % 12 min.
- Reduction in area % 25 min.

9 Test Specimens

9.1 The tension test specimen shall be taken from the middle of the head at the centre of a finished quenched splice bar.

9.2 The tension test specimen shall be machined to the form and dimensions for a standard 0.500" (12.5 mm) round tension specimen with 2" (50 mm) gauge length in accordance with ASTM A-370.

10 Frequency of Testing

10.1 One tension test shall be made from each lot of 1000 bars or less but not less than one from each heat treatment lot in the shipment.

10.2 If the results of the tension test do not meet the requirements, 2 additional pieces from the same lot shall be tested and if either one of these fails the heat treatment lot shall be rejected.

10.3 The manufacturer may re-treat such a lot but not more than twice and the re-treated lot shall pass the tests as above.

11 Finish

11.1 The splice bars shall be smoothly rolled, true to the template and shall accurately fit the rail section for which they are intended.

11.2 The splice bars shall be from injurious defects such as flaws, seams, checks and fins.

11.3 Any variation from a straight line in a vertical plane shall be such as will make the bars high in the centre. The camber in either plane shall not exceed 1/32" (0.8 mm) in 24" (610 mm) bars and 1/16" (1.6 mm) in 36" (915 mm) bars.

12 Identification

The name or brand of the manufacturer, the section designation, and the year of manufacture shall be rolled in raised letters and figures on the side of each bar.
QUALITY ASSURANCE

13 Application

Material ordered to this specification is subject to inspection with respect to all of the requirements of the specification.

14 Plant Access

The Railway's Quality Assurance Inspector shall have, during working hours, free entry to all parts of the manufacturer's plant used in the manufacture of material ordered to this specification. Inspection and all tests, except check analysis, shall be made at the place of manufacture prior to shipment, unless otherwise specified.

15 Quality Assurance Provisions

It is the manufacturer's responsibility to satisfy the Railway's Quality Assurance Inspector that the splice bars conform to this specification. This may be accomplished by either performing the tests prescribed in this specification or by demonstrating to the Railway's Quality Assurance Inspector that the manufacturing processes and techniques are so controlled that conformity to this specification is assured. The manufacturer shall maintain complete records of his examination and tests which shall be available to the Railway's Quality Assurance Inspector.

The Railway reserves the right to perform any of the tests set forth in the specification where such tests are deemed necessary to assure the splice bars conform to the prescribed requirements.

16 Return of Shipment

Material which does not comply with this specification or material which, notwithstanding tests, inspection or acceptance at any time or location, is found to contain deficiencies, will be subject to rejection and return to the manufacturer. The manufacturer shall be entitled to a joint inspection of defective splice bars at the Railway's premises. The manufacturer shall assume the expenses of handling and transportation in both directions.

17 Rehearing

Samples tested in accordance with Section 7 which represent rejected material shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the result of the tests, the manufacturer may make claim for a rehearing within that time.

18 Weight

The weight of the finished splice bars shall not vary from the calculated weight by more than 2%.

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