



A Division of Transnet SOC Limited

TECHNOLOGY MANAGEMENT

SPECIFICATION

RAIL AND MAST BOND FASTENERS

Author:	Engineering Technician Technology Management	M Masupha	
Approved	Senior Engineer Technology Management	LO Borchard	
Authorised:	Principal Engineer Technology Management	S E Sibande	<i>SE Sibande</i>

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1.0 SCOPE

- 1.1 This specification details Transnet's requirements for rail and mast bond fasteners for application on all types and sizes of rail and masts.

2.0 BACKGROUND

- 2.1 Transnet requires a standardized rail and mast bond fastening system based on the expanded collar fastening.

3.0 NORMATIVE REFERENCES

Unless otherwise specified all materials used, equipment developed and supplied shall comply with the latest edition of the relevant Transnet publications.

3.1 TRANSNET PUBLICATIONS:

- 3.1.1 BBC 7863: Connection of bonds to OHTE Steel Structures.
3.1.2 BBC 7864: Connection of OHTE Bonds to web of rail (rail methods).

4.0 SERVICE CONDITIONS

4.1 ENVIRONMENTAL CONDITIONS

Altitude:	0 - 1800 m above sea level
Relative humidity:	10% to 90%
Ambient temperature:	-10° C to +55° C
Wind pressure:	750 Pa
Lightning conditions:	20 ground flashes/km ² per annum
Pollution:	Heavily salt laden with industrial pollutants including diesel- electric locomotive emissions.

5.0 TECHNICAL REQUIREMENTS

5.1 MECHANICAL REQUIREMENTS

- 5.1.1 An expanded collar fastener with non-vibrating washers for use with bonding on rails and mast shall be provided.
- 5.1.2 The fastener shall be installed as per drawing BBC 7863 and BBC 7864.
- 5.1.3 Transnet has standardized on a 13.5 mm hole size for expanded collar fastener for bonding.
- 5.1.4 Both single sided and back-to-back systems shall only require a single hole.
- 5.1.5 The system shall be safe to use in all weather conditions.
- 5.1.6 The system shall be designed so that one size/length expanded collar shall be used for all rail and mast sizes.
- 5.1.7 The rail web thickness can vary from 11.5 to 19 mm.
- 5.1.8 The mast web thickness can vary from 7.5 to 10.5 mm.
- 5.1.9 The fastener shall comprise of and expandable tinned copper collar.
- 5.1.10 The area of the expandable collar in contact with the rail shall have a contact area not less than the contact area of the flange.
- 5.1.11 The diameter of the collar should at least be 31 mm.
- 5.1.12 The fastening pin shall have an M12 thread.
- 5.1.13 Non-vibrating wedge lock washers shall be used on both sides to prevent nut loosening.
- 5.1.14 Similar washers than the approved Nord Lock and Heico-Lock may be offered subjected to tests and approval by the Transnet Freight Rail, Technology Management (Electrical Technology) department.

5.2 ELECTRICAL REQUIREMENTS

- 5.2.1 The continuous current rating for the fastener system shall be a minimum of 100A for both AC and DC.
- 5.2.2 The fastener system shall not exceed a rise in temperature of more than 3 degrees Celsius in relation to the rail when exposed to the continuous rated current of the bond.

6.0 TESTING AND INSPECTIONS

- 6.1 Transnet reserves the right to be present at all tests and inspections as called for in this clause.
- 6.2 The responsibility of arranging the tests called for in this clause rests with the successful tenderer.
- 6.3 A Transnet Freight Rail, Technology Management (Electrical Technology) department representative may request any additional test deemed necessary to ensure compliance.

7.0 RATING PLATE AND INSTRUCTION LABELS

- 7.1 Each fastener shall be clearly marked on the outer surface of the flange, the identification mark of the manufacturer.
- 7.2 The mark shall under no circumstances influence the integrity of the connection.
- 7.3 The continuous current rating of the flange shall also be depicted on the flange.

8.0 DOCUMENTATION REQUIREMENTS

- 8.1 Drawings and technical documentation shall be submitted with tender.
- 8.2 The manufacturer must provide one soft copy and two hard copies of the technical specification.
- 8.3 The manufacturer must provide one soft and two hard copy of the method of installation.
- 8.4 The manufacturer must provide design and type test certificates to verify conformance to the requirements and these must be submitted with tender documents.
- 8.5 Supplier shall advise how to proceed with the equipment at the end of its operating life, taking into consideration environmental requirements and regulations.

9.0 PACKAGING, STORAGE AND HANDLING

- 9.1 Each fastener set shall be packaged with a user instruction and the package be clearly marked with the torque value.
- 9.2 There shall be a maximum of 20 fasteners per box.

10.0 GUARANTEE AND DEFECTS

- 10.1 The appointed tenderer shall guarantee that the supplied rail and mast bond fastener conforms to Transnet's requirements.
- 10.2 The appointed tenderer shall accept liability for makers' defects, which may appear in design, material and workmanship.
- 10.3 The appointed tenderer shall provide all information regarding guarantees and warranties in writing

11.0 METHOD OF TENDERING

- 11.1 Tenderers shall indicate clause-by-clause compliance document with the specification. This shall take the form of a separate document listing each of the specification's clause and sub-clause numbers, indicating the individual statements of compliance or non-compliance.
- 11.2 Statement of non-compliance shall be motivated by the tenderer in a letter format, as per 11.1. The letter and evidence of deviation shall be submitted as part of the tender document.
- 11.3 Tenderer shall submit comprehensive literature consisting of detailed technical specifications in accordance to clause 5.0 (Technical Requirements), the general constructional details and principal dimensions if not indicated on the provided Transnet Drawings.
- 11.4 Any items offered in accordance with other standards will be considered at the sole discretion of Transnet. The tenderer shall supply full details stating where the item differs from these specifications as well as supplying a copy (in English) of the recognized standard specification(s) with which it complies. Any deviations must be approved by Transnet Freight Rail, Technology Management (Electrical Technology) department in writing.
- 11.5 Failure to comply with clauses 11.1, 11.2, 11.3 and 11.4 could preclude a tenderer from consideration.
- 11.6 In the event of any conflict between the various submitted relevant documents, the order of precedence shall be, and in consultation with Transnet Freight Rail, Technology Management (Electrical Technology) department:

- a) Legal and safety requirements.
- b) This Specification.

END