

SPECIFICATION FOR STEEL PIPE FITTINGS FOR 3Ø A.C. FREIGHT ELECTRIC LOCOMOTIVE (WAG/9 LOCO)

SPECIFICATION NO. CLW/MS/3/068 ALT.15

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ISSUED BY:

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ALOK KUMAR CHAKRABORTY Digitally signed by ALOK KUMAR CHAKRABORTY Date: 2022.12.02 15:52:21 +05'30'	MANOJ KUMAR SAGAR Digitally signed by MANOJ KUMAR SAGAR Date: 2022.12.02 16:25:41 +05'30'	SYAMA PRASAD PATRA Digitally signed by SYAMA PRASAD PATRA Date: 2022.12.02 16:54:56 +05'30'
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1. **SCOPE** : This specification covers the manufacture and supply of Steel Pipe Fittings for compressed air transmission system viz. pneumatic brake system in WAG-9 class locomotive. Operating air pressure may be as high as 11.5 Kg/Cm². Normal working pressure is 10 Kg/Cm².
2. **SCOPE OF SUPPLY** : As per revised Annexure-A.
3. **CLIMATIC & ENVIRONMENTAL CONDITIONS** :
 - a) Maximum atmospheric temperature : Under Sun 70°C.
In shade.: 50°C.
 - b) Humidity : 100% saturation during rainy season.
 - c) Reference site conditions :
 - i) Ambient Temperature : Max. 47°C Min. 0°C
 - ii) Humidity : 60%
 - iii) Altitude : 160 m above sea level.
 - d) Rain fall : Very heavy in certain areas. The locomotive will be designed to permit its running at 10 Km/Hr in flood water level of 102 mm above rail level.
 - e) Atmosphere during hot weather : Extremely dusty and desert terrain in certain areas.
 - f) Coastal area : Locomotive and equipment will be designed to work in coastal areas in humid and salt laden atmosphere.
 - g) Vibration : The equipment, sub-system and their mounting arrangement will be designed to withstand vibration and shocks encountered in service as specified in corresponding IEC publications unless otherwise prescribed.
4. **STANDARDS** : Standards used in this specification are -
 - i) ASTM A108 Gr.1018 ii) ISO 7/1 iii) ISO 228/1
5. **GENERAL & TECHNICAL DATA** :
 - 5.1 All pipe fittings shall be made from carbon steel.
 - 5.2 Minimum Allowable stress value of all pipe fittings shall be 1378 bar.
 - 5.3 Safety factor shall be in 3:1
 - 5.4 Minimum Ultimate tensile strength shall be 4140 bar.
6. **MANUFACTURING** :
 - 6.1 Pipe fittings shall be made from forged/steel and properly machined.
 - 6.2. Pipe fittings shall conform to accompanying drawings.

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- 6.3. Pipe fittings shall not have any cracks/shrink holes/cold sets/pits/ sloppy edges/machining mark.
- 6.4. Pipe fittings shall have a safe, reliable, torque free and leak proof performance at all pipe connections.
- 6.5. Tapered and parallel threads shall conform to ISO 7/1 & ISO 228/1 respectively.

7. INSPECTION AND ACCEPTANCE :

7.1 Type Test

- a) The manufacturers shall indicate along their offer type tests to be carried out at the time of inspection at their works premises for approval of the purchaser. They shall have complete test equipments to conduct such tests.
- b) The manufacturers shall submit one prototype sample of each set (loco) for the purpose of inspection and other tests at their works premises to be witnessed by an authorised representative of the purchaser.

7.2 Routine Test

Routine inspection will be carried out by one authorised representative of the purchaser as per approved routine test programme, supplied by the manufacturer.

7.3 INSPECTION PLAN

The tenderer shall indicate the sample size including minimum size for routine inspection of each lot and the acceptance criteria. Acceptance shall be entirely based on drawings & standards.

8. SUPPLY OF DOCUMENTS (Apart from those indicated in BID documents)

8.1 Along with tender offer

- (a) Material specification
- (b) Standards
- (c) Complete type test, routine test and inspection plan.
- (d) Documentary proof if they have supplied similar pipe fittings to Railways /Industry.
- (e) Any deviation from the specified values shall be spelled out clearly by the tenderer.

8.2 Along with supply

- (a) Pressure ratings and tubing information
- (b) Installation information if any
- (c) Test certificates
- (d) Material certificate from approved test house.

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9. **QUALITY ASSURANCE** : As per ISO 9000
10. **MARKING** : Each pipe fitting shall have legible and indelible markings of (a) Size (b) Manufacturer's name/trade work (c) Max. working pressure (d) Month and year of manufacture.
11. **GUARANTEE** : 6 (six) years from date of supply or 5 (five) years from loco entering revenue service whichever is earlier. The materials/components which fail during the guarantee period should be replaced by the manufacturer/supplier free of cost.
12. **PACKING** : All pipe fittings shall be properly packed to avoid damage during transit and storage. A minimum storage period of 24 months shall be considered.
13. **REFERENCE** : All pipe fittings used by M/s. ABB Transportation for WAG-9 class (Co-Co) Electric Locomotive are supplied by
- (i) M/s Norden Hydraulics Connections
60-62 Benett Street
Dandenong 3175 (Australia)
 - (ii) M/s Baker A.E. & Co.
P.O. Box 744
795 Springvale Road (Australia)
 - (iii) M/s Duffield Frederick Pty Ltd.
Greens Road
Dandenong 3175 (Australia)
 - (iv) M/s Flexcon Pty Ltd. T/AS ENZED
P.O. Box 1296
CNR Princes H'way & Linley St.
Dandenong 3175 (Australia)
 - (v) M/s Vickers Systems Pty Ltd.
65-67 Glenvale crescent
Mudgrave, Victoria 3170 (Australia)

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