कार्यालय
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आधुनिक रेल डिब्बा कारखाना
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File No.: RBL-MD32221 Vol-I

Dated: 12.08.2025

Sub: Issue of specification No. MMDTS18009 Rev.04

Please find enclosed a copy of specification no. MMDTS18009 Rev.04 for Technical Specification for Thermal cum Sound Insulation material for Roof, Sidewalls and Under-frame of LHB Coaches for implementation.

DA: as above

(Shobhit Pratap Singh)
Dy.CME/Design-II

Dy.CME/MP/Fur	Dy.CME/FP& Paint	Dy. CQM-II	Dy.CMM/M&P/Fur
Dy.CME/D-I	CCMT	WM/ Paint	ACMT

Copy to: for kind information please.
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CWE/Fur

Specification	Technical Specification for Thermal cum Sound Insulation material for Roof, Sidewalls and Under-frame of LHB Coaches	MMDTS 18009 Rev-04 Page 1 of 16 Date: 12.08.2025

Name	Designation	Signature	Date	Level
Harikesh Kumar	SSE / Design		12/8/25	Prepared
Ashok kumar Agnihotri	SME /Design/Fur		12/8/25	Agreed
Shobhit Pratap Singh	Dy. CME / Design-II		12/8/25	Reviewed
D.K. Singh	CDE		12/8/25	Approved

Issue/Rev.	Details of changes	Date
01	a) Eligibility criteria added for the tenderer in clause 2. b) Type tests and acceptance tests defined in clause 12. c) Values for Moisture contents, shot content, sulphur content, Recovery after compression, Resistance to Jolting and Alkalinity added.	08.08.2018
02	a) Fixing of insulation with adhesive "CPRX compound" added specified in para VII of clause no. 2. b) Construction image deleted from clause no. 2. c) Gas analysis in smoke chamber using FTIR technique CITg (4) max. added in clause no.8. d) Reinforcing deleted from composition (clause no. 9). e) Minimum warranty of the insulating material changed from 15 years to 20 years (clause no. 12). f) All properties of FRP tissue and temperature resistance added (clause no 13). g) Clause no. 13 added, to specify submission of sample for three tests (clause no. 13)	08.04.2019
03	Eligibility criteria (clause 3.0) deleted.	06.08.2022
Rev.04	1. **Clause 2**: modified as "quantity of CPRX compound per coach (60 ltrs for AC coach & 20 ltrs. for Non AC coach approx)" elaborated. 2. **Clause 6**: Modified for fire reports requirements. 3. **Clause no.7:** Tests requirement/properties updated. 4. **Clause no.11:** Documents to be submitted along with offer/bid specified. 5. **Clause no.12:**Requirement of prototype approval detailed. 6. **Clause no.13:** Clause for Quality assurance, test & documents updated & elaborated. 7. **New clause:** Clause no.15 and clause no. 16 added.	04.08.2025

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Schedule of Technical Requirements

1. SCOPE:

This specification covers the general, technical and test requirements of Thermal cum acoustic Insulation material for Roof, Sidewall, End wall and Under-frame of Coaches.

2. Construction:

The construction of Thermal Cum Acoustic insulation material will be sandwich of Densified resin Bonded insulation Board (factory laminated) or closed cell foam made of polyolefin or hydrophobic melamine (factory laminated) with following layers:

I. First, topmost layer of perforated aluminium foil (outer layer)
II. Second layer of fiberglass tissue
III. Third layer of fiberglass board/foam
IV. Fourth layer of fiberglass tissue
V. Fifth layer of Black woven glass-fibre (outer layer).
VI. Each individual insulation slab shall be sealed from all four sides by using Aluminium tape before insulation.
VII. Each insulation slab shall be glued to the coach surface using CPRX compound (MDTS 153 Rev-nil or latest), quantity per coach (60 ltrs for AC coach & 20 ltrs. for Non AC coach approx). The material has to confirm all the properties mentioned in this specification. If any other material is offered, it shall require prior approval from MCF Design. Raw material for the insulation as per this standard should be indigenously available.

3. Salient features of the material:

i. The Insulation material to be supplied as per this standard shall meet the thermal, acoustic and fire properties as mentioned in para-4, 5 and 6 respectively.
ii. The Insulation material when subjected to vibration and Jolting tests shall conform to test specified in clause no.7 (sr. no. 13 & 14).
iii. Raw material for the insulation as per this standard shall be light weight, cost effective & indigenously available.

4. THERMAL PROPERTIES (for 25mm & 50mm):

Thermal conductivity (K-Value)	W/m.K @ 25 deg C mean temp	0.034 (Max.)	IS: 8183

5. ACOUSTIC PROPERTIES:

Noise Reduction coefficient (NRC) for 60 mm thickness	No unit	0.80 (min)	ISO 354 / ASTM 423

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Sound Transmission Class (STC) for 60 mm thickness	db	41 min.	ISO:10140-2/ ASTM E 90/ ISO 15186-1
Construction of Panel for STC test: Stainless steel sheet 3mm+Thermal cum Acoustic Board+3mm LP panel			

6. Fire Safety:

Fire safety property of thermal cum sound insulation material complete {Perforated aluminium foil (Top most layer)+Fibre glass tissue(second layer)+ Insulation board/foam(third layer)+ Fibre glass tissue(fourth layer)+ Black woven glass fibre(outer layer)} for thickness 25mm & 50mm as per standards shall be R1, HL3 as per EN 45545-2 : 2020 as under:

Description	Units	Value	Test standard
Fire and Smoke Characteristics as per EN 45545-2(Table-5) R1,HL3	-------	---------	EN 45545 (2): 2020
• Lateral spread flame CFE (Minimum)	Kw/m^2	20 (Min.)	ISO-5658-2
• Heat release rate (Cone Calorimeter method)MARHE (Max)	Kw/m^2	60 (Max.)	ISO:5660-1:50Kw/m2
• Smoke generation Ds(4) (Max.)	No unit	150 (Max.)	EN ISO:5659, 2: 50 Kw/m2
• Smoke generation VOF4 (Max.)	Min.	300 (Max.)	EN ISO:5659, 2:50 Kw/m2
• Gas analysis in smoke chamber using FTIR technique CITg(4) (Max.)	No unit	0.75 (Max.)	EN 17084 Method -1

Note: All the fire tests as mentioned in specification should be in a single test report.

7. Test requirements/properties for Insulation board/foam(for 25mm & 50mm):

Table-1

S. No.	Description	Units	Value	Test standard
1.	Density	(Kg/m3)	40+/- 15%	IS 8183
2.	Thickness	As per requirement		IS 8183
3.	Temperature resistance (Insulation Board/foam)	°C	-50 to +230 °C	IS 8183

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4.	Resistance to Micro Organism	------	No growth	As per IS 8183
5.	Limiting Oxygen Index (insulation Board/foam)	Percent	50 (Min.)	NES 714/ NCD 1410
6.	Horizontal Burning Rate	mm/min	0	IS:15061-2002, CLAUSE 3.2 and Annex A
7.	Melting Behaviour Test	No drop which ignites the cotton wool	No drop	IS:15061-2002, CLAUSE 3.4 and Annex C
8.	Moisture absorption	Percent	2 (Max.)	IS 8183
9.	Recovery after compression	Percent	90 (Min.)	IS 8183
10.	Shot content	Percent	15 (Max.)	IS 8183
11.	Incombustibility	------	Incombu stible	IS 8183 BS:476-Pt.4
12.	Sulphur content	Percent	0.6 (max)	IS 8183
13.	Resistance to Vibrations		1 % Max of height settlement	IS 8183
14.	Resistance to Jolting test		3 % Max of height settlement	IS 8183
15.	Alkalinity	pH	7-10	IS 8183

Note: Above properties (Table-1) is for Densified resin bonded insulation Board. However, If Insulation board/foam material is made of *Polyolefin or Hydrophobic melamine (factory laminated)*, properties shall be equivalent or superior than above properties mentioned in Table-1.

8. Composition and test/properties of Aluminium Foil:

- **Composition:**

S.No	Facing Composition	Description	Specified Value
1.	Foil	Aluminium	6.0-8.0 Microns
2.	Adhesive	Water based	4.0-6.0 g/m2

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3.	Kraft	Natural	Density 45-55 g/ m²

- **Test requirements/Properties:**

S.No	Physical Properties	Specified Value	Test Method
1.	Basic weight	95-120 g/ m2	Scale
2.	Water Vapour Transmission rate	1.1-1.2 ng/N.s	ASTM E 96 Procedure-A
3.	Bursting Strength	2.0-3.5 Kg/ cm²	ASTM D 774
4.	Tensile Strength	4.5(min)KN/m(MD) 2.5 (min)KN/m(XD)	ASTM C 1136
5.	Calliper Thickness	140-180 microns	Micrometer
6.	Water immersion	No de-lamination	24 hrs at 20-25°C

9. Requirement of Black Woven Glass Cloth:

Description	Data
Weight	140-160 gm/m2
Width	0.935m
Thickness	0.14mm± 15%
Colour	Dark Black

10. Requirement of FRP Tissue:

Description	Data
Weight	35 gm/m2 + 4 gm

11. Documents to be submitted along with offer/bid:

i. Supplier/OEM as per Rev.04 of this specification shall submit clause wise comments on the specification for compliance and deviation (if any).

ii. Supplier/OEM shall submit test certificate of parameters(clause 4 to 10) of specification from:

(a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in clause 4 to 10 in its scope of accreditation from NABL or report from NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.

(b) In case, there is no NABL accredited lab is available in India for some tests (with test method mentioned in the specification) and the test facility for same tests (with test method mentioned in the specification) are also not available with NTH/NPL, then for those tests, report from any Government's lab/any Government recognized lab for such test in India will be acceptable.

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(c) In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in clause 4 to 10 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific tests.

However, such labs must have NABL accreditation for ISO/IEC 17025.For such rare cases, self declaration shall be submitted by the supplier/bidder to the effect that test facilities for such specific test not available as per (a) & (b) of this para above. The self declaration in this regard, if found false/fake/forged/manipulated at any stage during evaluation of offers then purchaser reserves the right to summarily reject the offer or if found false/fake/forged/manipulated after placement of PO then action as per provision of contract regarding submission of false/fake/forged/manipulated documents will be taken.

In absence of any of above details for offered product, the offer would not be considered.

iii. The submitted test reports along with offer shall not be more than three (03) years old from the date of tender opening.

Note: Tenderer should be either OEM or an authorized dealer of the OEM and should submit tender specific authorization certificate as proof along with contact details (address, phone no., fax no., e-mail) of OEM along with the offer.

12. PROTOTYPE APPROVAL:

The Firm shall supply sample along with the following details at the time of prototype testing as per PO or as per applicable guideline:

i. Supplier shall submit test certificate for parameters(clause 4 to 10) of specification from:

(a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in clause 4 to 10 of specification in its scope of accreditation from NABL or report from NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.

(b) In case, there is no NABL accredited lab is available in India for some tests (with test method mentioned in the specification) and the test facility for same tests (with test method mentioned in the specification) are also not available with NTH/NPL, then for those tests, report from any Government's lab/any Government recognized lab for such test in India will be acceptable.

(c) In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in clause 4 to 10 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific tests.

However, such labs must have NABL accreditation for ISO/IEC 17025.For such rare cases; self declaration shall be submitted by the supplier/bidder to the effect that test facilities for such specific test not available as per (a) & (b) of this para above. The self declaration in this regard, if found false/fake/forged/manipulated at any stage after

placement of PO then action as per provision of contract regarding submission of false/fake/forged/manipulated documents will be taken.
These tests shall be done during initial approval, change of design and change of manufacturing process or raw material.

ii. Material and Safety data sheets.

iii. For thermal conductivity test, noise reduction coefficient and sound transmission class, firm has to submit the sample to MCF for test. The cost of these three tests shall be borne by the firm.

iv. The bulk manufacturing shall be undertaken only after approval of Prototype. This clause of Prototype approval is applicable for the first supply by new firm as well as in case of change of design and change of manufacturing process or raw material.

13. Quality Assurance, test & documents:

Requirement description	Requirement detail	Remarks
Quality Assurance plan	The manufacturer shall have the detailed quality Assurance plan. The Plan shall be submitted for the approval by respective PU. The QAP document shall clearly document the following and control the test record formats. **1.** Control over outsourced products and processes **2.** Testing of raw material and establishing its traceability **3.** Sampling Plan **4.** Type Tests **5.** Routine Tests **6.** Acceptance tests **7.** Raw Materials	The QAP shall be submitted in PDF as per MCF format (Annexure-A)
Type Tests	These tests shall be done on a sampled lot of prototype. Such Tests are required only on initial approval, change of design and chance of manufacturing process or raw material. These tests are to be repeated as detailed in prototype approval process after every 36 months or as specified as quality control measure. • Fire and smoke characteristics as per EN 45545-2, R1, HL3 (clause no. 6). However, if the consignee or inspecting agency desires to do the type tests, before 36 months,	The records of the type tests shall be maintained by the manufacturer and shall be made available upon demand. These records shall be traceable and verifiable.

	the supplier should not deny the same. There are various circumstances when type tests may be needed before three(03) year of last type tests. eg: • In case of doubt in type test certificate. (Previous) • Complaint regarding type test certificates. • Failure of material attributable to any of the parameters covered in type tests, etc. *Moreover, during type test, all tests, listed in routine tests & acceptance tests shall also be conducted.*	
Routine Tests	These tests are required to verify the functional working of the system. These may require simulated in-puts for testing the operation under full range of inputs. These tests shall be done and record to be maintained for inspection. These tests are to be repeated after every 12 months or as specified. • Thermal Conductivity • Noise Reduction coefficient (NRC)@ 60 mm thickness • Sound transmission Class (STC)@ 60 mm thickness • Temperature resistance • Resistance to Micro organism. • Limiting Oxygen Index • Horizontal Burning Rate • Melting behaviour test • Resistance to Vibration, • Resistance to Jolting • All Properties of Al. Perforated Foil • All properties of Black glass cloth • All properties of FRP tissue • Heat Release Rate (HRR) *Moreover, during routine tests, all tests, listed in acceptance tests shall also be conducted.*	The records of the Routine tests shall be maintained by the manufacturer shall be made available upon demand. These records shall be traceable and verifiable.
Acceptance tests	These tests shall be done on all or samples of lot for bulk supply. Sampling shall be done as per IS:2500 or IS:8183-2024 Following tests shall be considered as	These shall be conducted by the consignee or their authorized agency prior to dispatch.

	acceptance tests: • Bulk Density • Thickness & dimensional Check • Recovery after Compression • Shot Content • Moisture absorption • Incombustibility, • Sulphur Content • Alkalinity • Density of base material wool • Construction, basic wt. and calliper thickness of aluminium foil as per clause no. 8. Documents for satisfactory Routine test & Type test with above detailed periodicity & validity shall also be checked during acceptance test & enclosed with acceptance test documents. Documents for satisfactory audit report as per para no. 16 of this specification shall be checked & enclosed as part of acceptance test. This audit report should be valid as per periodicity of audit required in para no. 16 of this specification.	All infrastructures required to enable acceptance tests shall be provided by the supplier / OEM. The records of the acceptance tests shall be enclosed along with the supply consignment. These records shall be traceable and verifiable.

Note:

1. For thermal conductivity, noise reduction coefficient and sound transmission class, firm has to submit the sample to MCF for test during prototype approval only. The cost of these three tests shall be borne by the firm.
2. Supplier shall submit test certificate of parameters (clause no. 4 to 10) of specification for Type Tests, Routine Tests & Acceptance tests from :

(a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in clause no. 4 to 10 of specification in its scope of accreditation from NABL or report from NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.

(b) In case, there is no NABL accredited lab is available in India for some tests (with test method mentioned in the specification) and the test facility for same tests (with test method mentioned in the specification) are also not available with NTH/NPL, then for those tests, report from any Government's lab/any Government recognized lab for such test in India will be acceptable.

(c) In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in

clause 4 to 10 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific tests.
However, such labs must have NABL accreditation for ISO/IEC 17025.For such rare cases; self declaration shall be submitted by the supplier/bidder to the effect that test facilities for such specific test not available as per (a) & (b) of this para above. The self declaration in this regard, if found false/fake/forged/manipulated at any stage after placement of PO then action as per provision of contract regarding submission of false/fake/forged/manipulated documents will be taken.

3. If purchaser requirement is only 25 or 50mm, then these test shall carried out on only 25mm or 50mm as applicable. If purchase requirement is both (25mm & 50mm), then these test shall be carried out on 25 mm as well as 50mm.However, Acoustic property shall be conducted as per clause no.5.

14. Warranty:

Minimum warranty of the insulating material shall be 20 years from the date of application of the material in the coach.

15. List of Machineries & plant and testing facilities :

A. Machinery and Equipments :

1. Slitting machine (at least 01 no.)
2. Compressors- 6 bar (at least 01 no.), 3 bar (at least 01 no.)
3. Compression packing m/c. (at least 01 no.)
4. Batch House-30 MT/D (at least 01 no.)
5. Melter-30 MT/D(at least 01 no.)
6. Forming machine (at least 01 no.)
7. Vacuum pump (at least 01 no.) (760 mm of Hg or more)
8. Process water filtration and recirculation system (at least 01 no.)
9. Resin & binder preparation equipment (at least 01 no.)
10. Effluent treatment Plant (at least 01 no.,30 MT/D) if process of manufacturing & testing result in discharge(in case of complete recycling resulting in discharge may be exempted)
11. Facing Lamination machine (at least 01 no.)
12. Fork lift - 3 ton (at least 1 no.)
13. Rolling up/stacking machine (at least 01 no.)

B. Essential Testing facilities

1. Measuring scale (at least 01 no.)
2. Measuring tape (3m & 5m) (at least 01 no. each)
3. Sound level meter (at least 01 no.)
4. Varnier calliper (at least 01 no.)
5. pH meter (pH 0 to 14) (at least 01 no.)
6. Moister analyser or thermostat fitted drying oven with a suitable vent (at least 01 no.)
7. Laboratory Oven (0 to 400 °C) (at least 01 no.)

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8. Humidity Chamber, (0 to 99% RH, 0 to 99 °C) (at least 01 no.)
9. Hot Plate (0 to 250 °C) (at least 01 no.)
10. Projection Microscope (0 to 1 mm) (at least 01 no.)
11. Sieve mesh-class A(BSS NO: 30, BSS NO:60 BSS NO:100)
12. Ignition Test Apparatus (0 to 800 °C) (at least 01 no.)
13. Compression Testing machine (0 to 10000 N) (at least 01 no.)
14. Vibration Tester & Jolting Machine (0 to 6000 Minute/100Hrs) (at least 01 no.)
15. Water bath Thermostatic (0 to 100 °C) (at least 01 no.)
16. Weighing balance (0 to 100 Kg, 0 to 3 Kg & 0 to 220 gms)
17. Muffle Furnace (0 to 1200 °C) (at least 01 no.)

Note: Clause no. 15 of this specification no. MMDTS 18009 Rev.04 shall be effective for tender opening date after (9) month from the date of issue of this specification.

16. Process audit requirement(in every 3 years):

Audit of OEMs for manufacturing & testing activities of material will be done by M/s RITES or any agency authorized by concerned PU in every 3 years.

It shall be responsibility of OEM to get audit done by M/s RITES or any agency authorized by concerned PU at its own cost.

Auditor will audit manufacturing & testing process at premises of the supplier. During audit, all tests (facilities which are available in premises of supplier) shall be conducted as per specification & shall be made part of the report. However, auditor shall pick & send sealed sample to labs as detailed in of this specification for testing of all parameters in clause 4 to 10.Reports of tests from labs shall also be made part of audit report. However, provisional audit report, if required, may be issued meanwhile, once, with validity period of maximum of 3 months, before receiving reports from labs. In case of issuance of provisional report, final report must be issued as soon as lab reports are received, as provisional audit reports can be valid maximum up to 3 months only. CCA /Audit report from any of PUs (RCF/ICF/MCF) will be considered for the purpose of compliance of this clause.

Note:

i. CCA/ Audit report for Resin bonded Fibre glass wool as per MDTS207 (Rev.5.2 or latest) or Thermal insulation foam as per MDTS 28001 (Rev.5 or latest) or both (as per MDTS207 Rev.5.2 & MDTS 28001 Rev.5) will also be considered as acceptable CCA/Audit report for compliance of para 16 of the specification.

ii. This clause no. 16 of this specification shall be effective for tender opening date after (9) month from the date of issue of this specification MMDTS 18009 Rev-04.

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MCF QAP format (Annexure-A)

Name of the firm

Head Office Address	Manufacturing Unit Addresses	
ABC XYZ STATE with PIN Telephone: Mobile: Email:	ABC XYZ STATE with PIN Telephone: Mobile: Email:	Add more columns if more required

PL Number of the item	
Description of the item	
Specification/Drawing number of the item	
Purchase order number with date	

Date of submission of QAP: DD.MM.YYYY

Approved by	Issued by	Page Number
Signature with date and stamp	Signature with date and stamp	1 of X

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ANNEXURE-I

QAP	PL Number & Item Description	Internal Doc. No.	Revision
Name of the firm		ABCD-1234	XX

Index of QAP

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ANNEXURE-I

QAP	PL Number & Item Description	Internal Doc. No.	Revision
Name of the firm		ABCD-1234	XX

1. Company Profile (*Maximum 250 words*)

May include brief history, date of setup, founders, products/services, organization chart, article of association of the company as per companies act,1956.

2. Certificates and Essential Documents

Clear images/scans of factory license and ISO certifications (9001, 14001, others). Please ensure that the text is legible.

3. Process Flow chart/Installation Flow Chart

Description of manufacturing process

A. Process flow chart indicating various stages/activities of manufacturing process for an individual product, with quality control points

B. Details of manufacturing & testing processes to comply specification(s)

Sl. No.	Clause	Requirement of manufacturing process as per specification	Process details to comply the specification requirements

Note

(i) Process flow chart shall indicate all the operations involving procurement, handling, manufacturing, & testing of the product from raw material to finished product, including RDSO/RITES/Consignee inspection/dispatch.

(ii) There should be a separate flow chart for each item.

4. Details of Procurement - Raw material/Components/Sub-assemblies

A. Details of components/sub-assemblies manufactured in-house

Sl. No.	Item Name	Drawing No	Material Grade	Source of Raw Material

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ANNEXURE-I

QAP	PL Number & Item Description	Internal Doc. No.	Revision
Name of the firm		ABCD-1234	XX

B. Details of components/sub-assemblies purchased from approved sources of ICF/MCF/RCF/RDSO

Sl. No.	Item Name	Drawing No	Material Grade	Source (Firm name & Address)

C. Details of outsourced/imported items

Sl. No.	Item Name	Drawing No	Material Grade	Source (Firm name & Address)

5. Inspection Procedure

Provide the inspection process followed at the firm for subject item(s). It may include stage inspections where critical parameters are inspected before sending to the next stage, material composition test when the material is received from an outside agency, inspection of material properties and critical dimensions at the time of final dispatch to Indian Railways units. Kindly provide details in the following format.

Sl. No.	Type of inspection Raw material or Incoming product/ Assembly or Stage/Final dispatch of the item to consignee	Sample Size & its Frequency of inspection	Inspection parameter	Mode of inspection/ Test equipment used	Criteria or limits of acceptance	Record of inspection maintained at Register No./Computer file name & address

Note: Provide internal inspection dimensional/material checklists for raw material, stage assembly, final assembly, as annexure.

6. Rejection Handling Plan

Rejections are part and parcel of any manufacturing process and can occur at any stage. It is essential to have a clear plan to handle the rejections due to various reasons. In a few situations, rework may be done to correct the workpieces. In others it might not be feasible and/or recommendable. A rejection handling plan clarifies the rejection criteria and further required processing for rework or scrapping. Analyzing rejects is a key component to improve the efficiency and quality of the output.

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ANNEXURE-I

QAP	PL Number & Item Description	Internal Doc. No.	Revision
Name of the firm		ABCD-1234	XX

Kindly provide the details of handling rejection of work-in-process (WIP) and recording such incidents.

7. Tool and machine calibration plan

The machines, tools, fixtures, jigs, gauges, and instruments used for manufacturing, testing, and inspection should be regularly calibrated to ensure that they are accurate for their intended use. A schedule of calibration for all the essential machines, tools, gauges, and instruments may be planned by taking into account both usage rate and that machine's particular maintenance needs. Kindly provide details in the following format.

Sl. No.	Name and ID of Tool/Machine/Gauge/ Instrument	Make and Model Number	Range/Capacity	Frequency of calibration	Due date of calibration	Record of calibration maintained at Register No./Computer file name & address

8. Requirement of Qualified/Experienced Personnel as per Specification(s)

Details of qualification/experience of the quality control personnel specified in the relevant STR/MDTS/ Specification for the items to be manufactured may be provided in the following format.

Sl. No.	Specified Requirements		Details of Personnel Employed			
	Clause number with specification details	Qualification/ Experience	Name	Designation	Technical Qualification	Experience

Note: Welding procedure specification (WPS), Welding Procedure Qualification Record (WPQR) and Welder Qualification Test Certificate (WTC) to be submitted wherever applicable.

***

Note: "This QAP does not have any deviation from Purchase order" will be written on front page of QAP.

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