

## RAIL COACH FACRTORY, KAPURTHALA

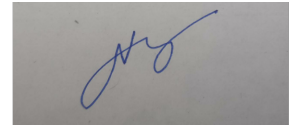
MD35131

Dated: 23/10/2024

**Sub: Issue of MDTS 35407 Rev Nil “Technical specification for Single leaf manual sliding Body side entrance door for Bangladesh Railway”.**

Please find enclosed copy of following specification for information and necessary action at your end.

#	Description	Specification No.
1.	TECHNICAL SPECIFICATION FOR SINGLE LEAF MANUAL SLIDING BODY SIDE ENTRANCE DOOR FOR BANGLADESH RAILWAY	MDTS 35407 Rev Nil



Nitin Yadav  
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स्थापित: 1986

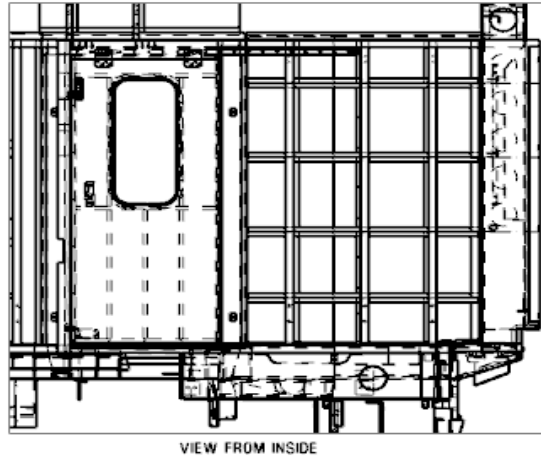
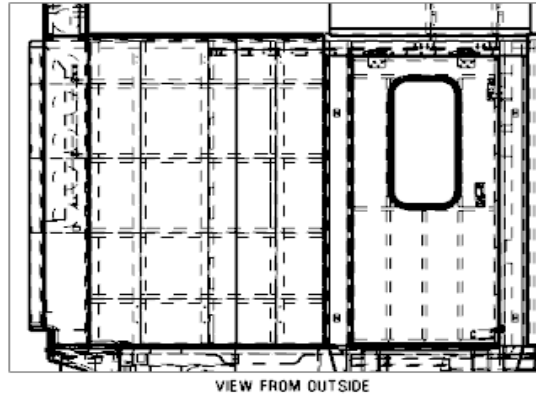


**RCF**  
KAPURTHALA

Government of India  
Ministry of Railways  
Rail Coach Factory  
Kapurthala  
Punjab 144602  
ESTT: 1986

बांगल

## Technical specification for Single leaf manual sliding Body side entrance door for Bangladesh Railway



Specification Number	MDTS 35407	
Revision Number	NIL	Date Issued: 15 October 2024

### BRIEF DESCRIPTION:

This specification covers the general, Functional Requirements and Technical Requirements of Single leaf manual sliding Body side entrance door for Bangladesh Railway.

## **FOREWORD**

This technical specification is prepared for requirements of Single leaf manual sliding Body side entrance door for Bangladesh Railway.

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Lalit Kishore	CDE	LALIT KISHORE <small>Digitally signed by LALIT KISHORE Date: 2024.10.18 12:00:48 +05'30'</small>	Approved

Rev. No.	Details of changes	Date

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**(Part-A, Brief Description of Scope)**

**1. Preamble:**

- 1.1. This specification covers design, development, supply and installation and commissioning of pre fabrication, single leaf manual sliding main entrance body side door assembly complete including locking and sliding mechanism and with its associated accessories and all hardware required for installation of system.
- 1.2. This specification is intended to cover the general conditions and technical requirements/provisions related to materials, constructions and tests and do not include all the necessary provisions of the contracts.
- 1.3. The coaches are required for long distance passenger transportation on locomotive hauled high-speed trains and the door shall be designed to meet the performance requirements enumerated in subsequent clauses of this specification. Other specifications relevant to door system may be referred to in conjunction with this specification.
- 1.4. In case the tenderer needs any clarification in respect of any clause of this specification or regarding the exhibited drawings, the tenderer shall obtain the same from RCF.

**2. Scope of supply:**

- 2.1. This specification covers the design, development, supply and installation and commissioning of pre-fabricated, single leaf manual sliding body side door assembly complete including sliding mechanism, maintenance free Lower guides, portal sealing frame of the door, locking and with its associated accessories and all hardware required for installation of system. The installation and commissioning of the complete door system shall be made in the Coaches by the supplier. Space for the sliding mechanism will be finalized during design freeze.
- 2.2. Any additional item considered necessary for operation of the door but not included in this specification.
- 2.3. The tenderer shall submit clause wise comments to this specification and submit deviation in the offer, if any RCF reserves the right to summarily reject the offers submitted without clause wise comments.

**3. Reference drawings:**

Sr. No.	Description	Layout no.
1.	LAYOUT OF BG SHO VAN CAR WITH DINING CAR & PRAYER ROOM (WECCD) FOR BANGLADESH RAILWAYS	BJ90007
2.	LAYOUT OF BG SHO VAN CHAIR CAR (WEC) FOR BANGLADESH RAILWAYS	BJ90006
3.	LAYOUT OF BG AIR-CONDITIONED CHAIR CAR (WJCC) FOR BANGLADESH RAILWAYS	BZ90003
4.	LAYOUT OF AC POWER CAR WITH LUGGAGE VAN & GUARD BRAKE (WJPCLR) FOR BANGLADESH RAILWAYS	BP90003
5.	LAYOUT OF BG AIR-CONDITIONED SLEEPER CAR (WJC) FOR BANGLADESH RAILWAYS	BA90003

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6.	LAYOUT OF AC AMBULANCE SLEEPER CAR (WJMC) FOR BANGLADESH RAILWAYS	BM90001
7.	LAYOUT OF BANGLADESH AIR CONDITIONED INSPECTION CAR	BI90001

**4. Submission of documents along with the offer:**

- 4.1. The tenderer shall submit the details of scope of supply along with the offer which will be used for technical evaluation of the offer only.
- 4.2. Technical documents indicating brief description and functioning of whole door system.
- 4.3. Schematic indicating dispositions of all the components/equipment on coach body.
- 4.4. The tenderer shall submit the relevant documents towards the eligibility criteria as a proof of compliance.
- 4.5. The estimated weights and center of gravity for door should be given by supplier.
- 4.6. Supplier should devote particular attention to the design of door to get quiet operation condition.
- 4.7. Tenderer shall enclose the relevant installation drawings of the proposed door arrangement which shall contain details regarding material, interface dimensions, specifications, estimated weight of the door and scope of supply. The mechanical forces of the door system acting in the interfaces to the coach body should be submitted.
- 4.8. The list of spares for servicing for reserve equipment, spare parts for maintenance and parts subjected to wear.

Note: The door suppliers are responsible for door functioning and therefore, a complete supply of the various equipment is a must.

**5. Deviations (MUST be spelled out clearly in the offer):**

- 5.1. In case the offer does not correspond to this specification in any respect, a "Deviation statement" shall be submitted by the tenderer. This statement shall clearly give the clause-wise deviations with technical reasons for the same.
- 5.2. Clauses not covered by the deviation statement shall be deemed to be acceptable to the tenderer in all respects. In case a deviation statement is not submitted, it would be taken that the complete specification is acceptable to the tenderer.
- 5.3. In addition to the offer against this specification, the tenderer may submit alternative offers giving adequate technical justifications for the same.

**6. Contractor's responsibility:**

- 6.1. The contractor shall be responsible for the execution of the contract strictly in accordance with the terms of this specification and the conditions of contract, notwithstanding any approval which purchaser or the inspecting Officer may have given for the following;
  - 6.1.1. The detailed drawings prepared by the contractor
  - 6.1.2. His sub-contractors for materials
  - 6.1.3. Other parts of the work involved by the contractors
  - 6.1.4. The test carried out either by the contractor and/or by the purchaser and / or the Inspecting Officer
  - 6.1.5. Approval of UIC where available shall be indicated

**7. Guarantee / Warranty:**

- 7.1. For door supplied by the contractor, in case of any part of the door system failing or proving unsatisfactory in service due to defective design, material or workmanship, within 84 months from the date of supply or 72 months from the date of commissioning of coach, whichever is earlier and shall replace the same at his own cost and risk. Further, should any design

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modification be made in any part of the equipment offered, the period of 72 months would commence when the modified part is commissioned in service.

- 7.2. Door shall be subjected to detailed trials as per specification. Any modifications found necessary as a result of these tests or further service trials shall be carried out by the contractor at his own cost in the coaches in a manner approved by the purchaser. All key and manufacturing drawings incorporating the modifications shall be submitted to RCF for final approval.

**8. Spare parts, reserve apparatus, wearing pieces:**

- 8.1. The offer shall include recommended list of spare parts required for day-to-day maintenance of the door equipment and spares for the various sub-assemblies for the maintenance at the time of POH. The list shall include the part number, quantity required and price of each component.
- 8.2. Tenderer shall ensure availability of all spares for a period of at least 10 years. This shall be irrespective of the fact whether the tenderer or his sub-contractor(s) have stopped manufacturing of the equipment to the design supplied to IR/BR.
- 8.3. It is proposed to stock sufficient minor components and spares to meet renewal and replacement on account of wear or occasional failure, for a period of 5 years' service. Tenderer shall, therefore, submit a classified list of spares, (unit exchange, spares & stage / normal maintenance) for each type of equipment of door system, which he recommends for stocking.
- 8.4. The tenderer shall indicate in an itemized list, the life expectancy of components subjected to wear under Indian conditions.

**9. After sales services:**

- 9.1. Contractor may be required to send his technical expert during the installation and commissioning of their equipment on coach/coaches.
- 9.2. Contractor shall also depute his technical expert on request by the Purchaser to investigate and attend to specific problems that may come up during actual operation.
- 9.3. Contractor shall associate with Indian Railways during the trials. He shall also undertake to modify the system supplied, if required as a result of trials.
- 9.4. Contractor shall supply at-least 4 compact discs (CD) of the Operation & Maintenance Manuals and Servicing Instructions. These should normally include:
  - 9.4.1. Details of attention to be given during IOH / POH or any other schedule.
  - 9.4.2. Test procedure and standards for various door requirements on test bench.
  - 9.4.3. Details of gauges, jigs & fixtures, tools, machinery and plant for maintenance of door system.
  - 9.4.4. Typical defects and their remedial measures.
  - 9.4.5. List of spares for day-to-day maintenance and at the time of IOH / POH in the form of periodic overhaul kit.
  - 9.4.6. Identification codes (manufacturer's name / trade mark) and month & year of manufacture shall be punched / engraved on the main equipment and their component parts to avoid mixing by mistake of different applications and for setting down warranty claim for smooth and efficient working.
  - 9.4.7. Maintenance standards including clearances and tolerances at various locations and permissible limits of wear for good service performance of equipments.
  - 9.4.8. Tenderer shall submit the frequency and detailed work content of various inspection / maintenance schedules necessary for maintenance of the system offered by him. Whether these requirements are time based or distance travelled based shall be indicated for each schedule.

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#### 10. Packing:

- 10.1. Contractor shall ensure that all outer parts and exposed critical portions of the various items of the system are suitably covered with protection caps to prevent ingress of foreign matter / damage to these items during handling and storage.
- 10.2. Contractor shall also ensure that all items of the system equipment in an assembled condition are adequately packed before dispatch to prevent damage in transporting, handling and storage. The safe transportation shall be the responsibility of manufacture.

#### (Part-B, Brief Description of technical requirements)

1. **Climatic and Environmental Conditions:** The door arrangement shall operate reliably and safely under following climatic and Environmental conditions:
  - 1.1. Maximum temperature under sun 70°C
  - 1.2. Maximum temperature under shade 45°C
  - 1.3. Minimum temperature -10 °C
  - 1.4. Humidity 100% saturation rainy season.
  - 1.5. Rain falls Fairly heavy.
  - 1.6. Atmosphere during hot weather Dusty
2. **Other parameters:**
  - 2.1. Train Speed: 200 kmph
  - 2.2. Train Passing Speed: 200 kmph
  - 2.3. Aerodynamic load pulses: max. +/- 2500Pa [UIC 566: 1990; § 2.1.2.1]
  - 2.4. Dry weather: Dust and dirt in atmosphere.
  - 2.5. Exposure to Salt Laden Air in coastal areas.
  - 2.6. Maximum bogie rotation & swing 3.5", 82 mm
  - 2.7. Width over body as shown in layout drawings
  - 2.8. Gauge 1676 mm

**Environment:** Coaches shall be working in coastal area with salt laden and corrosive atmosphere.

#### 3. Mechanical interfaces:

- 3.1. The door and accessories have interface with sidewall, roof end parts, AC trough, lavatory module, doorway ceiling, door frame etc depending upon the type of coaches and relevant drawings to be procured by supplier at the time of design freeze.
- 3.2. The firm should make the manual sliding doors suitable for coaches for which this item has been tendered. The relevant and latest drawings for shell sub-assemblies and other drawings for reference only will be provided to successful bidders at the time of design freeze of the door.
- 3.3. The supplier shall make effort to mount the door on the existing structure. There should not be any infringement with existing structure/accessories. This shall be agreed during design freeze.

#### 4. Interface Responsibility:

- 4.1. The location of mounting points and the design of equipment installation comprising of the Door shall be as per interface drawings and to be got approved from CDE/RCF to avoid the mechanical interference with other equipment for the vehicle. The supplier shall be responsible for mounting method and providing all materials for mounting as specified in the drawings.
- 4.2. The supplier shall be responsible for the design of the Door and the submission of design information and the execution of test and inspection.

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- 4.3. Any changes of the components comprising of Door shall be defined by the supplier and approved CDE/RCF in order to avoid the mechanical interference with other equipment for the vehicle.

**5. Design Requirements & Mechanical strength requirements:**

- 5.1. The single leaf manual sliding door system must be robust enough to encounter vibrations and jerks, light in weight and proven design. The mounting arrangement shall be designed to withstand satisfactorily the vibration and shocks encountered in service in compliance to EN 61373.
- 5.2. The material used in door system must comply with EN 45545-2.
- 5.3. Door shall meet the mechanical strength requirements as per UIC 566 appendix-9 and not contradict EN regulations. The firm/ supplier shall supply a certificate from a NABL accredited laboratory in this regard.
- 5.4. Sliding door shall have smooth running, without jerks and low noise operation.
- 5.5. Stainless steel to RDSO/Spec.-C-K: 201, X5CrNi1810 or AISI: 304 shall be used for construction of stainless-steel parts where material grade of stainless steel has not specified.
- 5.6. Guide rail should be designed in such a way that its top portion remains below then the floor level. Guide rail have provision of holes in its bottom for drainage the rain water and dust.
- 5.7. All rubber items used in this door should be of EPDM.
- 5.8. The door shall have pleasant and good-looking appearance.
- 5.9. Door should remain in closed condition during normal train running and should not move/ open up owing to centrifugal force experienced on curvatures or under normal vibrations.
- 5.10. Stopper shall be fitted at the end of the door in open position to stop the door without jerk.
- 5.11. Move mechanism shall be tested for endurance simulating actual working strokes on coach for 500,000 continuous cycles. At the end of endurance test, there should not be any deterioration in performance of any component. The supplier shall get the doors tested from a reputed firm/ laboratory or their own automatic test stand with digital counter for endurance testing and shall submit a certificate to RCF in this regard.
- 5.12. All sharp edges and corners shall be rounded off.
- 5.13. Only qualified welders as per EN 287 shall be used for welding. It is preferred that the manufacturer is certified as EN 15085.
- 5.14. There should be no replaceable parts needed to be changed up to at least 3 years or till 5,00,000 cycles in the proposed door sliding system.
- 5.15. The door leaf shall not go outside from the side wall in permitted loading conditions.
- 5.16. The inner and outer skin of the door leaf shall be formed in such a way as to be lightweight, of adequate strength, and internally reinforced and formed into an integral unit, in such a way as to prevent injury to passengers.
- 5.17. Doors shall be vibration free and insulated against heat and sound transmission. The doors shall be free from dimples, warping, spot welding depressions and any other blemish.
- 5.18. When door is closed and locked, door leaves shall be capable of withstanding loads imposed by passengers according to EN 14752. The doors shall be designed and tested such that the door leaves sustain such pressure with no permanent deformation. The Contractor shall submit test procedure based on best international practices.
- 5.19. Door guides and supports shall be mounted within the section of doorway protected by the door seals.
- 5.20. The door system should be using Passive Sealing System to keep it operable and tight with small rubber damage.

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- 5.21. Door sealing shall also be such that the saloon interior noise specification is satisfied. Door sealing arrangement shall be adequate to prevent water ingress due to torrential rain and coach washing through manual wash plant.
- 5.22. Doors when closed should be not rattling and effectively sealed to prevent entry of water, dirt and debris under normal operating conditions.
- 5.23. The materials used for the door track rollers and seals shall take into account of hygroscopic effects in high humidity tropical environments.
- 5.24. The sealing arrangement shall take into consideration of coach body manufacturing tolerance and deflections under fully loaded conditions.
- 5.25. Adequate care shall be taken to ensure no part of door machinery is visible from inside / outside the saloon when door is closed.
- 5.26. The estimated weights and center of gravity for door. The weight for door should be less than 100 kg.
- 5.27. Minimum clear door opening should be 700mm and finalized during prototype of the door.
6. **Door System - Configuration:**
  - 6.1. The door system is basically formed by a door leave, a sliding/move mechanism located in the upper portal area.
7. **Door Leaf:**
  - 7.1. Door leaf shall be made up of sandwich construction of stainless-steel frame with stainless steel sheet of AISI 304 of 1 mm thick on both sides filled with rigid phenolic foam to IS: 13204-1991 density 32 kg/m<sup>3</sup> inside the door leaf. The firm may offer alternate material for door leaf with adequate technical justification. Thickness of door leaf should not be less than 50 mm.
  - 7.2. Door leaf should be of Sandwich-Construction with welded stainless-steel frame. Leaf-Camber should be according coach-shape (if required).
  - 7.3. Window on the door should be of insulated safety glass and mounted to a rubber seal. Length & width of window glass to be decide at the time of design freeze.
  - 7.4. Door windows shall be replaceable without removal of the door leaf.
  - 7.5. Provision of handgrips inside and outside on each door leaf to support manual opening and closing. They should be positioned to allow operation from rail as well as platform level.
  - 7.6. Suitable hand safe rubber gasket/beadings with adequate softness and durability shall be provided at the end of the door leaves to ensure that the passengers are not hurt during closing of the doors.
8. **Door Operator (sliding/move mechanism):**
  - 8.1. The operator shall be overhead mounted, readily accessible for maintenance and well protected from rain, dirt and other environmental factors.
  - 8.2. The door operator and its linkages shall be designed with sufficient internal damping to prevent the door from bouncing.
  - 8.3. The use of a Stainless Steel robust linear roller guide is preferred. The linear roller guide shall be maintenance free at least 3 years with a single annual preventive maintenance.
  - 8.4. All side doors shall be adjusted to be opened or closed manually with a maximum force of 5kg with door operator.
  - 8.5. The door operator must have preloaded characteristics to Eliminate Wobble and Unwanted Play.
9. **Locking:**
  - 9.1. Locking should be positive lock mechanism for door system closed and locked.
  - 9.2. The design of system should allow the door leaf can always be manually pushed into the closed position and can withstand the full-service loads.

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9.3. The latch mechanism of the door lock shall design for easy adjustment and resistance against portal deformation during train operation. The door locking device shall incorporate both a latch and a hook to positive lock the door from inside the coach under all portal deformation when coach is operated at speeds. From outside the locking arrangement should be provided on the door to achieve the full locking of the coach.

9.3.1. Door should be temporary locked from both side and users are also able to open this lock from other side of door.

9.3.2. Manual permanent lock to lock the door from inside.

9.3.3. From outside the locking arrangement should be provided on the door to achieve the full locking of the coach

#### 10. Noise:

10.1. Supplier should devote particular attention to the design of door to get quiet operation condition. All equipment should be designed to eliminate rattling and resonance at all speeds up to maximum 200 kmph.

#### 11. Design submission:

11.1. The supplier shall get the approval from CDE/RCF for the following before taking up the prototype manufacture:

11.1.1. Interface drawings including 3D model in parasolid.

11.1.2. Dimensional assembly drawings.

11.1.3. Strength calculation of door

11.1.4. Movement analysis of door.

11.1.5. Quality Assurance plan.

Requirement Description	Requirement Detail	Remarks
<b>Quality Assurance plan</b>	The manufacturer shall have the detailed quality assurance plan. The Plan shall be submitted for the approval by RCF/KXH. 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. Raw Materials	The QAP shall be submitted in Hard copy signed by the head of Quality department of the manufacturer for approval.

11.1.6. Test scheme for type test and routine test.

#### 12. Approval of design and drawings:

12.1. The design shall be developed based on the technical & performance requirements given in this specification and sound engineering practice. The entire design shall be submitted by successful tenderer with technical data and calculations to RCF for approval.

12.2. The design shall be developed in SI units.

12.3. The supplier shall submit the complete door system in 3D Parasolid model.

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- 12.4. Material grade / specifications for each component shall be indicated on the relevant drawings of the firm.
- 12.5. 'Approval' of the design means the approval of the general design features. Notwithstanding the approval, the contractor will be wholly responsible for the performance of the door system as well as individual components offered.
- 12.6. The contractor shall submit separate drawings for each of the item of door system. Each drawing shall show sufficiently sectioned view of the particular equipment so that every component of the equipment is identified.
- 12.7. Contractors shall submit a complete set of drawings to purchaser RCF well in time for approval. These drawings shall contain the necessary details / dimensions as specified and shall also take into account all the requirements of the contract.
- 12.8. Further changes / modifications in the door equipment may be called for with a view to achieve standardization and interchange ability. Contractor shall be obliged to incorporate necessary changes in the design of his equipment for this purpose.

### 13. **Prototype approval:**

- 13.1. The prototype approval is applicable on the first supply of material as per this specification from a supplier.

### 14. **Operation and Maintenance (O&M) Manuals:**

- 14.1. The Supplier shall provide manuals i.e. Operation Manuals, Maintenance Manuals, Technical Manuals, Illustrated Parts Catalogue and Spare parts.
- 14.2. **Operation Manuals:** The supplier shall provide operation manuals explaining the purpose and operation of the complete system together with its component subsidiary systems and individual item of equipment. The characteristics, ratings and any necessary operating limits of the Equipment and Sub-systems shall be provided.
- 14.3. **Maintenance Manuals:** The Supplier shall provide maintenance and overhaul/repair manuals showing details of the door and sub-systems from a maintenance, with particulars of operating parameters, tools for dismantling and testing, methods of assembly and disassembly, tolerances, repair techniques, frequency of each maintenance type and all other information necessary to set up an overhaul and repair and servicing program. A summary of maintenance schedule shall be included in the Maintenance Manual.
- 14.4. The maintenance manual shall also include an illustrated parts catalogue of all plant supplied and shall contain sufficient information to identify and requisition the appropriate part by maintenance staff.
- 14.5. The Supplier shall submit the O&M manuals with the first batch of Door.

### 15. **Fire Safety:**

The Fire Safety requirements shall be met, but not be limited to. The requirement of EN 45545 - 2.

### 16. **Equipment Type and Routine test:**

- 16.1. The records of the tests shall be maintained by the manufacturer and shall be made available upon demand. These records shall be traceable and verifiable.
- 16.2. The supplier shall be responsible for the type tests of Door. The test plan and test procedures shall be submitted to RCF for approval to CDE/RCF. The type test program shall cover at least the test plan according EN 14752:2005 Annex E. The tests shall be done with the first parts produced under serial conditions. The strength test shall perform static and dynamic loads according to requirement. The test shall show at least  $1 \times 10^6$  pressure pulses with 2.500 Pa, sinus shaped load curve, at 4 Hz.

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Kind of test	Type test	Routine Tests
Strength Test	O	
Endurance Test	O	
Water tightness Test	O	O
Noise transmission Test	O	
Fire Performance Test	O	
Visual Inspection	O	
Dimensional Inspection	O	

16.3. **Compatibility Type Testing:** The Supplier shall be responsible for the compatibility type test between vehicle and Door at the first coach. The test plan and test procedures shall be submitted to CDE/RCF for approval.

**17. Performance test:**

- 17.1. Detailed trial scheme for single coach (static and running) door will be drawn up before conducting the trials in consultation with the contractor. They shall advise the details of equipment required for testing the door. Trial scheme to be agreed between RCF & Contractor during design freeze.
- 17.2. The purchaser or the inspector may specify agreed test during design freeze to satisfy him of the performance of the requirements and shall assist the purchaser in conduct of these tests.

**18. Preventive coatings:**

- 18.1. Equipment to be supplied shall be free from injurious defects that may impair their strength. Contractor shall also ensure that all items are adequately treated and painted (excluding flange faces) to prevent corrosion.
- 18.2. Door system shall be painted with colour as per interior and exterior colour scheme of the coach. The surface of light alloy castings shall be anodized.

**19. Inspection:**

- 19.1. The complete door equipment to be supplied by the contractor shall be inspected and accepted by the inspecting authority nominated by the purchaser in the supplier's plant.
- 19.2. The complete door equipment as fitted on coach shall also be tested for its performance. Contractor shall be responsible for the proper functioning of the door equipment, as per procedure laid down to be mutually agreed to between the contractor and RCF.
- 19.3. Inspecting authority shall have access to insight all detailed manufacturing / original collaborator's drawings for all items of equipment. Contractor shall be obliged to table these drawings as and when called for during approval phase.
- 19.4. The inspecting authority will carry out inspection as per procedure commonly agreed during design freeze to reassure that the material is being furnished in accordance with these specifications. In this regard the contractor shall not be entitled to object on any ground whatsoever on the nature and procedure of testing that may be followed by the inspecting authority in line with commonly agreed procedure during design freeze.

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- 19.5. The performance test and inspection shall be carried out at the works of manufacturer as per relevant specification. The contractor shall provide necessary equipment for such test.
- 19.6. Door system set shall be routine tested in supplier's plant in the presence of IR/BR inspecting officer. The cost shall be borne by contractor.
- 19.7. During the fabrication, subsequent inspection visit, the door supplier shall allow IR inspection officer.

**20. Marking:**

- 20.1. The supplier shall fix engraved or punched metallic name plate with the help of rivet on each door mentioning the following details:
- 20.1.1. Manufacturing Date
  - 20.1.2. P.O. No. of item
  - 20.1.3. Specification No. with Revision
  - 20.1.4. Manufacturer's complete address like name of contact person, e-mail, Mob No., Land Line No., Place of Works etc
  - 20.1.5. Name of item and its Sr. No
  - 20.1.6. Supplier's Name, (if the items have been supplied through approved manufacturer).
  - 20.1.7. *Notices for users and maintenance personnel shall also be supplied for fixing in each coach, as decided between supplier and consignee. These stickers shall not be visible to the passengers easily.*

**21. Up gradation of design:**

- 21.1. *Supplier may offer alternate design of doors for all the above or any of the above clauses with a view to upgrade the design.* The supplier in such case shall give clause wise justification. Specification details may be deviated from those specified above, if sufficient technical justification is available. However, RCF's decision on all such matters shall be final.