

**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**



सत्यमेव जयते

**SCHEDULE OF TECHNICAL REQUIREMENT (STR)
FOR MANUFACTURE & SUPPLY OF PASSENGER ESCALATORS**

STR No. RDSO/2017/EM/STR/0002 (Rev '1')-2019

**ISSUED BY:
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Amendment/ Revision history

| SN | Amendment | | Revision | | Reason |
|----|-----------|------|----------|----------|---|
| | Number | Date | Number | Date | |
| 1. | | | 1 | 18.11.19 | ED/Research/RDSO letter no. R2/ 142/ Vendor dated 07.01.19 and Rly Bd letter no. 2011/Elect(G)/150/3/ Pt. E-Office: 3257440 dated 01.08.19. |
| 2. | 1 | - | - | - | --- |

**SCHEDULE OF TECHNICAL REQUIREMENTS (STR) FOR
MANUFACTURE & SUPPLY OF PASSENGER ESCALATORS**

1.0 General:

- 1.1 Railway Board vide its letter no. 2006/Elect(G)/150/9/Pt.I dated 03.12.2015 have directed RDSO to develop sources for passenger escalator customize to Indian Railways application. In this regard RDSO has finalized technical specification for escalator and STR described in this document will define essential infrastructure required for manufacturing of passenger escalator as per RDSO specification.

The vendors willing to get enlisted as RDSO approved vendor should satisfy themselves about having complied with the technical requirement of specification & infrastructure requirement mentioned in this document.

The firm should have currently valid ISO-9001:2015 certification for his works address, covering the items for which he seeks registration with RDSO. It shall be ensured that the certifying body which issues the ISO: 9001 certificate is accredited by an accreditation body that is a part of the International Accreditation Forum (IAF) under the Multilateral Recognition Arrangement (MLA). The list of all such accreditation bodies is available at the IAF website at: <http://www.iaf.nu>.

2.0 Credential:

- a) The Firm should directly or through its Indian vendor have an experience of Design, Manufacture, Supply, Installation and Commissioning of minimum 20 nos. of passenger escalator to Indian Railways, Metro Rail, Monorail, High Speed Rail, Airport or any other Government owned/controlled public transport agency.
- b) The firm should directly or through its Indian vendor have established service centers with qualified technical engineers in at-least 20 cities in India and maintained at least 50 escalator-years under Annual Maintenance Contract with Indian Railways, Metro Rail, Monorail, High speed rail, Airport or any other government owned/controlled public transport agency in last three and current financial years.

3.0 Minimum Facilities:

The information shall be furnished as per details required in the following Annexures:

- 3.1 M & P required shall be as per **Annexure-I**. However it does not specify the capacity and quantity of various items of equipment/components M&P which may vary according to the manufacturing capacity of the individual firm. The firm should also have the facility for storing the raw materials and finished product.

3.2 Measuring/Checking Instruments/Gauges:

List of facilities for measurement and gauges required in firm's premises shall be as per **Annexure-II**. The accuracy and capacity of the measuring equipment shall be adequate to meet the requirements. Records of calibration of all measuring instruments shall be maintained and made available, on demand.

- 3.3 **Exclusive R&D facility:** Apart from normal manufacturing set-up shall be available. The firm shall indicate the organizational structure of their R&D wing along with qualification of the personnel. Firm should have following engineering manpower:

Mechanical discipline: at-least one Engineering Graduate (Mechanical related) Design Engineer with experience of more than 5 years in the field of escalator, and at least three or more Diploma Engineer with experience of more than 5 years in the field of escalator.

Electrical and Electronics Discipline: At least one Engineering Graduate (Electrical /Electronic related) Design Engineer with an experience of more than 5 years in the field of escalator and at least three or more Diploma engineer with an experience of more than 5 years in the field of escalator.

- 3.4 Firm should have technically qualified personnel in the field of design, manufacturing & testing of passenger escalator.
- 3.5 Firm should also have trained welders with minimum qualification of ITI in welding.
- 3.6 Firm should have an in-house facility to train installation and maintenance technicians so as to provide efficient and reliable services.
- 3.7 Necessary design and simulation software for electrical and mechanical design.
- 3.8 **Handling /Storage/Delivery:** The manufacturer shall have proper facilities for handling and storage of raw material and finished product. The supplier shall control packing presentation and marking process so as to ensure conformity to the Railway requirement.

ANNEXURE –I**Manufacturing Facilities:**

1. The following minimum Machinery and Plants to be available at the Firm's own manufacturing Premise.

A. List of machinery:

- i) Over head cranes of suitable capacity
- ii) MIG Welding M/c
- iii) Arc welding M/c
- iv) Stud welding M/c
- v) Piller Drilling M/c
- vi) Radial Drill M/c
- vii) Band saw M/c
- viii) Hydraulic Power Press M/c
- ix) Bench Grinding M/c
- x) Bending M/c
- xi) Power press
- xii) Compressor
- xiii) Lathe M/c
- xiv) Materials Handling and movement system

B. List of fixture:

- i) Truss top side frame fixture.
- ii) Truss bottom side frame fixture.
- iii) Truss inclined side frame fixture.
- iv) Truss assembly fixture.
- v) Top track fixture.
- vi) Bottom track fixture.
- vii) Track general assembly fixture.
- viii) Balustrade inclined portion assembly fixture.
- ix) Balustrade top and bottom portion assembly fixture
- x) Step deflection test rig.
- xi) Skirt and balustrade deflection test rig.
- xii) Handrail splicing and joining facility.
- xiii) Escalator type test structure.

2. The following Machinery and Plants are considered essential for manufacturing unit and could be made available at either firm's own Premises or firm's approved sub-vendor's premises.

- i) Hot Dip Galvanizing Plant
- ii) Powder Coating M/c
- iii) Oven
- iv) Furnace
- v) Hydraulic Press
- vi) Power Press
- vii) Planing M/c
- viii) Facing M/c
- ix) Straightening M/c
- x) Shearing M/c
- xi) Polishing M/c

Machines for PCB

- i) Dust free environment for the assembly of PCBs.
- ii) Automatic/light beam guided component insertion machine for PCBs.
- iii) Temperature controlled wave-soldering machine with auto-fluxing facilities
- iv) Dry heat and Damp heat test chamber for PCB*
- v) Full Convection Reflow M/C
- vi) Automatic Coating M/C
- vii) Ultrasonic PCB CLEANING M/C
- viii) Bending and Cutting M/C
- ix) E S D protection in line with IS: 10087-1981
- x) Winding Machine (optional)**
- xi) Ferruling Machine

Note:

* If firm do not have facility of Dry heat and Damp heat test chamber, they should get type testing of PCB in accordance with relevant IEC for dry heat and damp heat test from labs.

** If transformer used in control panel is procured from outside market then this machine is not required. However, type testing of transformer used should be carry out in testing labs.

Annexure-II

Inspection and measurement equipment:

Firm should have following equipment:

- Motor insulation testing facility--- at manufacturer place
- Full load test facility of motors---- at motor manufacturer place
- Burn in test facility for PCB--- at PCB manufacturer or sub vendor place
- Functional testing of PCBs preferably with computer.---at PCB manufacturer or sub vendor place
- Full function Controller test panel---- at manufacturer place.
- Other measuring instruments like as Brinell Hardness Test Machine, Rockwell Hardness Test Machine, Techo Meter, Power analyzer, Power factor meter, Galvanization Thickness tester, Vibration Analyzer and other measuring instruments for physical verification of various parameters should be available at manufacturer place.

Note – All the measuring instruments shall confirm to relevant IS/IEC standards with up to date calibration.

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