

ISO9001-2015	Document No.: TM/SM/468	Revision 02	Date Effective From: 24/12/2020
Document Title: <b>Specification of Broad Functional Requirement of Battery Operated Rail Drilling Machine</b>			



# Specification of Broad Functional Requirement of Battery operated Rail Drilling Machine

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First Revision, 2017

**Second Revision, 2020**

**Track Machines & Monitoring Directorate**

**RESEARCH DESIGNS AND STANDARDS ORGANISATION  
Manak Nagar, Lucknow-226011**

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### 1.0 SCOPE:

This specification covers the material, technical and functional requirements and testing criteria of 'Battery Operated Rail Drilling Machine' which is needed for drilling holes in all section of rails using core drill bit. This specification mainly covers the technical provisions having no connections with necessary contractual provisions. In this specification "Battery Operated Rail Drilling Machine" will be termed as "machine" for conveniences. The machine should comprise of an integrated battery with drilling unit coupled together rigidly to form a compact unit.

- 1.1 All the provisions contained in RDSO's ISO procedures laid down in Document No. QO-D-8.1-11 dated 12.09.2018 (titled Vendor – Changes in approved status"), subsequent versions / amendments thereof shall be binding, and applicable on the successful manufacturers/suppliers in the contracts floated by Railways to maintain quality of products supplied to Railways.
- 1.2 Preference to make in India: compliance of the instruction contained in public procurement (preference to make in India) order -2017 "Make in India" and latest guidelines issued in this regard shall be ensured.

### 2.0 MATERIAL:

- 2.1 **Rail Clamp:** The rail clamp shall be made of tough, durable and light weight material having sufficient mechanical strength. The rivet/bolts used in the clamp shall be of high tensile category.
- 2.2 **Power Source:** The Machine shall be powered by suitable battery with good records of service with wide service network in India. Robust construction & low maintenance cost are of particular importance. The manufacturer should furnish the information regarding make & model of battery proposed to be used & details of service network and availability of spares in India.

### 3.0 FUNCTIONAL REQUIREMENTS:

- 3.1 It should be able to drill straight (centrally to both axes) hole upto 38 mm dia. in the rail web of any type and section of rail from 60 R to 60 kg/m having UTS of 70 to 90kg/mm<sup>2</sup> with suitable clamp, as close as 46 mm from rail ends with tolerance for diameter & position of hole within  $\pm 0.5$  mm.
- 3.2 Machine should be supplied with mono rail cum nylon wheel to enable machine to carry/transport on mono rail/plain surface or any other suitable arrangement for easy transportation.

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#### 4.0 TECHNICAL FEATURES.

i	Weight of the complete unit including all attachments/ Battery for drilling holes (excluding transportation arrangement)	26 kg. max.
ii.	Capacity of power source and drilling time	Sufficient to drill hole in 60kg 90UTS rail section within 1 minute.
iii.	fixing time of rail clamp and the Machine	Fixing arrangement should be firm and easy and should not take more than 2 minutes for fixing to commence drilling operation
iv.	No. of drillings with full charged battery	35 nos. with $\phi$ 28 mm or 32mm for 60 kg 90UTS rail section

#### 5.0 TESTS:

##### 5.1 Test at the time of initial approval (*Type Tests*):

Following type test are to be conducted on Prototypes at the time of initial approval. The manufacturer/supplier shall produce **two prototype** samples before inspecting officials for type tests. The cost of type tests shall be borne by the manufacturer/supplier. All arrangement to conducts type tests shall be made by manufacturer/supplier.

- i) Visual & Dimensional check – The Machine shall be visually checked for visual defects like rough finishing, cracks, loose fittings etc.
- ii) Weight of the machine shall be checked as per clause 4.0 (i).
- iii) Battery performance as per clause no. 4.0 (ii) & (iv)
- iv) Drilling Performance Test:  
The prototypes shall be tested for drilling performance. In 60 kg, 90 UTS rail, holes shall be drilled and following details shall be recorded. Minimum 35 holes with each prototype sample shall be drilled out.
  - a) Fixing time of the machine.
  - b) Drilling time for every drill.
  - c) The tolerance of diameter & position of the hole.
  - d) Firmness of gripping before and after every drill.

##### 5.2 Following type tests are to be conducted at the time of supply (**Acceptance Test**): Acceptance tests are to be conducted inspection against zonal railways/purchaser's purchase order.

- (i) Visual & Dimensional as per clause no. 5.1 (i)
- (ii) Drilling performance test as per clause no. 5.1 (iv). Minimum 05 holes per sample shall be drilled.
- (iii) Weight of machine shall be checked as per clause no.4.0 (i).

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5.2.1 Any of the sample which fails in the testing as per clause no. 5.2, shall be rejected. However if the sample subjected to drilling performance test fails, the inspecting officials may reject whole lot or pass each machine after subjecting to the acceptance tests as per clause 5.2.

## 6.0 INSPECTION:

The inspection of the machine shall be carried out by the purchaser Zonal railway or any representative/other agency authorized by purchaser/ zonal railway. The inspection procedure and the test scheme should be submitted to the purchaser for approval. The cost of inspection and testing shall be borne by the manufacturer/supplier.

6.1 Minimum level of inspecting official shall be SSE.

## 7.0 WARRANTY & AMC:

7.1 Any part of the machine failing or proving unsatisfactory in service due to defective design, material or workmanship within 12 months from the date of commissioning shall be replaced by the supplier/manufacturer at his own expenses. If any design modification is made in any part of the equipment offered, the period of 12 months would commence from the date of such modification

7.2 During procurement of the machine, railways should go post-warranty AMC with the supplier for a pre-determined period as decided by the purchaser railway as per Comprehensive Guidelines on Procurement, Operation, Maintenance and Repair of Small Track Machine Report no TM 227. This may be incorporated in the tender document as a condition of contract/Tender/Supply.

## 8.0 Service Facility & Spare Parts:

8.1 Service Engineer: The contractor shall provide at reasonable cost the service of competent engineers during the guarantee period. The service engineers shall be available for instructions to operating, repair and maintenance staff.

8.2 The expected life of the components should be indicated along with their condemning limits. The machine should be supplied with the necessary spare parts for the operation and maintenance. The spare parts required should be detailed in separate list indicating description, part number, quantity and possible source of procurement.

8.3 The manufacturer shall be responsible for the subsequent availability of spares to ensure trouble free service during the life time of the machine.

8.4 Each machine shall be supplied with a complete kit of tools and spare parts required by the operator in emergency and for normal working of the machine.

## 9.0 DOCUMENTATION & INSTRUCTION MANUALS:

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- 9.1 Detailed operating manual, maintenance, safety and service manuals shall be specifically prepared and two copies each of the same shall be supplied with each machine.
- 9.2 Frequency of various maintenance operations like servicing overhauling etc. shall be indicated by the supplier.
- 9.3 **Maker's test certificate:** Copies of the maker's certificate guaranteeing the performance of the Machine should be supplied in duplicate along with the delivery of each Machine.
- 9.4 **Drawings:** In order to facilitate subsequent maintenance in service, the manufacturer/supplier shall supply details drawings of the machine exhibiting clearly the materials and dimensions.
- 10.0 Training and commissioning:**  
Adequate demo and training in operation and maintenance of the machine shall be imparted to railway operators at the rate of one operator per machine by the manufacturer either at manufacturer's premises or at railway premises, as mutually agreed between the purchaser and the supplier. The supply will be considered as complete only after this demo and training. That will be treated as commissioning of machine.
- 11.0 Marking and Packing:**
- 11.1 The machine shall be legibly and indelibly marked with:
- i) Name, initials, contact no. and trade-marks of manufacturer.
  - ii) Serial number of machine.
  - iii) Month & year of supply.
- 11.2 The Machine shall be packed in wooden/suitable carton after covering with good quality plastic sheets as per best trade practice to avoid any damage during transshipment.

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