

1199246/2022/O/o PED/INFRA-1/RDSO

ISO 9001-2015	Document no. TM/SM/OTT/321	Version-02	Date Effective From: 07.06.2022
Document Title: Specification of Off Track Tamper (Engine Mounted Version)			



**SPECIFICATION OF OFF-TRACK TAMPER  
(Engine Mounted Version)**  
(No. TM/SM/OTT/321 dated 28.01.09)  
Second revision of 2022

Track Machines & Monitoring Directorate

**RESEARCH DESIGNS AND STANDARDS ORGANISATION  
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JRE/SSE/SSRE	ARE/DTM/EDTM	PEDTM	Page no.
Prepared by:	Checked by:	Issued by:	<b>1 of 6</b>

ISIRI/2015	Document No. TMSM/OTT/321	Version-02	Date Effective From: 07.06.2022
Document Title: Specification of Off Track Tamper (Engine Mounted Version)			

## 1.0 SCOPE:

This specification covers technical, material and functional requirements with testing details of off-track tampers. The Off Track Tampers are intended to be used as a regular means of packing for spot attention/picking up slacks in between two successive tamping with heavy on track tamping machine on concrete sleeper track on Indian Railways. As the vibration level is low with higher imparted energy to ballast and light in weight having no separate power source, it could be used for attending yards as well as mid sections. Off Track Tampers will be termed as “Tamper” in this specification.

**1.1** Preference to make in India: Compliance of the instructions contained in public procurement (Preference to make in India) order -2017 “**Make in India**” or latest instructions issued on the subject shall be ensured.

**1.2** Supplier is fully responsible to maintain the quality of product supplied to Indian Railways.

## 2.0 MATERIALS, PROCESSING AND WORKMANSHIP:

**2.1** One set shall consist of 4 hand held tampers with internal power source with tools/blades along with each hand held tamper. These tamping equipments shall be able to tamp the concrete sleeper track including locations like points & crossings, bridge approaches, level crossing approaches and switch expansion joints etc.

**2.2** The tamping tool of the tamping equipment shall be made of alloy steel / High Carbon steel or equivalent to attain following minimum parameters:-

- (i) Tensile strength - 1100 N/mm<sup>2</sup>
- (ii) Hardness - 280 HB

## 3.0 FUNCTIONAL REQUIREMENTS:

### 3.1 Tamping Equipment:

3.1.1 The equipment shall be light in weight, portable and shall work without traffic block with normal track protection. The equipment shall be easily transportable to the sites of work.

3.1.2 The tool/blade of the tamping equipments shall be so designed that it can penetrate under all types of sleepers. The unit shall have sufficient power to push the ballast underneath the sleepers during packing without crushing. The tamping tools/blades shall be replaceable when they become thin/rounded due to wear and tear. The technical features of the tamping equipments shall be as per clause 4.0.

3.1.3 The maximum continuous running time shall not be less than 30 minutes.

3.1.4 The handle of the tamper shall be so designed that vibrations produced by the system during tamping shall not cause undue fatigue to the operator. The handle of tamper shall be

JRE/SSE/SSRE	ARE/DTM/EDTM	PEDTM	Page no.
Prepared by:	Checked by:	Issued by:	2 of 6

ISIRI 9091-2015	Document No. TMSM/OTT/321	Version-02	Date Effective From: 07.06.2022
Document Title: Specification of Off Track Tamper (Engine Mounted Version)			

preferably adjustable for the height of operator.

- 3.1.5 Fixing of tamping tool in the tamper shall be easy like push and rotate type/other suitable method.
- 3.1.6 For ear-protection against the sound emitted during operation of machine, suitable ear protector shall be supplied along with safety apron and Anti-Vibration gloves/vibration resistant gloves (four sets) shall be supplied by the manufacturer with each set.
- 3.1.7 The length of the tamping equipment including tool shall be sufficient so that operator needs not to bend his body forward during packing of the sleepers. The tamping tool shall be of 'swan neck' type to facilitate the penetration of ballast under the sleeper with a very little deflection of the tamper.

#### 4.0 TECHNICAL FEATURES:

SN	Description	Required Dimension
1.	Dry weight (without tool)	Upto 26 kg
2.	Power source	In-built engine
3.	Rated capacity of engine	Sufficient to drive the tamper at full load
4.	Engine Type	Air-cooled petrol/other fuel driven, self/re-coil start
5.	Fuel tank capacity	Min. 1 lit.
6.	Min. continuous running time	30 minutes
7.	Fuel consumption	Max. 1.5 lit./hour
8.	Percussion rate	1500 ± 10% blows/minute
9.	Vibration control	The tamper shall be fitted with suitable vibration dampening system so that it doesn't cause undesirable fatigue to the operator so that optimum use of the machine could be done for full duty hours
10.	Working Relative Humidity	Up to 99%
11.	Noise level of power source.	110db (Max.)
12.	Spade of the tamping tool	The tamper shall be fitted with suitable vibration dampening system so that it doesn't cause undesirable fatigue to the operator so that optimum use of the machine could be done for full duty hours.
13.	Transporting arrangement	Tamper shall have suitable arrangement/wheels fitted to the frame to move it on single rail without disturb the track signaling while transporting from one side to another side and on cess during shifting from one working point to another at site. Being light in weight and no separate power source, it

JRE/SSE/SSRE	ARE/DTM/EDTM	PEDTM	Page no.
Prepared by:	Checked by:	Issued by:	3 of 6

ISIRI 2015	Document No. TMSM/OTT/321	Version-02	Date Effective From: 07.06.2022
Document Title: Specification of Off Track Tamper (Engine Mounted Version)			

	could be carried on Bi- cycle/Motor cycle.
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## 5.0 TESTS:

### 5.1 Acceptance Tests:

Following tests shall be carried out (either in the factory premises/field or Certificate from Govt. /Govt. approved laboratory):

#### (i) Visual & Dimensional check:

The tamper shall be visually checked for its components, orientation of handle, power off/on switch, tool insertion sleeve etc. The design of tamping tools shall be as per clause 4.0 (12).

#### (ii) Operational Test:

The engine shall be started, run for ten minutes and stopped thereafter. No unusual sound /behavior of the engine during this operation shall be allowed. This process shall be repeated five times with an interval of the 10 minutes in between two successive cycle of operation.

#### (iii) Noise level Test:

The engine shall be started and run full throttle. The level of noise shall be measured at a distance of 5m from the engine and shall not exceed 110 db.

#### (iv) Field Test:

**Tests** shall be tested in field as per actual site conditions. For field test, a stretch of at least 40 m of concrete sleeper track fitted with 52 Kg/60 Kg rail with minimum clear ballast cushion of 100 mm shall be selected. The track shall have at least 25 GMT of traffic annually. The track portion under trial shall have dips/slacks/ and low joints, uneven surface. Testing patch near any stop signal shall be avoided. Detailed procedure of tamping shall be as mentioned in the working instructions vide Para 606 or relevant Para of IRPWM-June 2020. The quality of the packing shall be checked by observing the movement of track under traffic before and after packing. During field test followings shall be checked for:

- i. Whether the ballast is penetrated in the voids/under the sleepers with ease.
- ii. Whether sleeper corners and ballast is damaged due to vibration of tamping tool.
- iii. The operator is experiencing excessive fatigue and how long the operator is able to operate the tamping equipment continuously.

#### (v) Test for chemical composition and mechanical properties of tamping tool/blade:

Certificate from Govt./Govt. approved laboratory shall be produced for chemical composition and mechanical properties of tamping tool/blade as per clause 2.2.

#### (vi) Test for handling & transportation:

The tamper shall be moved on cess /uneven ground and on rail. The movement shall be trouble free and smooth.

JRE/SSE/SSRE	ARE/DTM/EDTM	PEDTM	Page no.
Prepared by:	Checked by:	Issued by:	4 of 6

ISIRI-2015	Document No. TMSM/OTT/321	Version-02	Date Effective From: 07.06.2022
Document Title: Specification of Off Track Tamper (Engine Mounted Version)			

## 5.2 Tests at the time of supply:

**5.2.1** Acceptance tests are meant to be conducted on selected samples/every tamper of the consignment which are taken from supplies under inspection against zonal railways'/ purchasers' P.O. Followings are the tests schedule for acceptance:

SN	Test	No. of samples to be tested
i	Visual & Dimensional check [as per clause 5.1 (i)]	Every tamper of the consignment
ii	Operational Test [as per clause 5.1. (ii)]	Every tamper of the consignment
iii	Noise level Test [as per clause 5.1. (iii)]	Every tamper of the consignment
iv	Field Test [as per clause 5.1. (iv)]	Every tamper of the consignment
v	Chemical composition and mechanical properties tamping tool/blade [as per clause 2.2]	Manufacturer/supplier shall of produce the certificate
vi	Test for handling & transportation	Every tamper of the consignment

**5.2.2** The Inspecting Officials may pass each equipment after subjecting it to pass each test as per clause 5.2.

**5.2.3** After the equipment have been supplied at consignee premises, the supply shall be considered as complete only after field training is provided by the supplier as per clause 10.0

## 5.3 INSPECTION:

**5.3.1** The inspection of the machine shall be carried out by the purchaser Zonal Railway or any representative/agency authorized by CTE of the Zonal Railway. The cost of inspection and testing shall be borne by the supplier/manufacturer. Copies of maker's test certificate guaranteeing the performance of the machine should be supplied in duplicate along with the delivery of each machine.

**5.3.2** Minimum level of inspecting official shall be SSE.

**5.3.3** Compliance of specification shall be verified at the time of inspection.

## 6.0 WARRANTY & AMC:

**6.1** Any part of the tamper 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 supplier/manufacturer at his own expenses. If any design modifications is made in any part of the equipment offered, the period of 12 months would commence from the date of such modifications.

**6.2** During procurement of the tamper, 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

JRE/SSE/SSRE	ARE/DTM/EDTM	PEDTM	Page no.
Prepared by:	Checked by:	Issued by:	5 of 6

IS 9001:2015	Document No: TMSM/OTT/321	Version-02	Date Effective From: 07.06.2022
Document Title: Specification of Off Track Tamper (Engine Mounted Version)			

condition of contract/Tender/Supply.

## 7.0 SERVICE FACILITY AND SPARE PARTS (INCLUDING TOOLS):

7.1 Each tamper 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. A complete list of tools and a catalogue of spare tools shall be supplied along with the procedure to be used with the machine.

7.2 The manufacturer shall be responsible for subsequent availability of spares to ensure trouble free service for the normal life of the machine.

7.3 In order to facilitate subsequent maintenance in service, the manufacturer/supplier shall supply two set of schematic diagrams. These shall exhibit clearly the details of the various components.

## 8.0 DOCUMENTATION:

8.1 Instruction Manual: Detailed operating and maintenance manual in duplicate for the tamper shall be supplied by the manufacturer with each set of the machine. The operating manual shall contain the trouble-shooting, maintenance instructions to be followed in the field and the normal life of the tamper. The maintenance schedules shall be clearly indicated in the maintenance manual.

8.2 Copies of the maker's certificate guaranteeing the performance of the tamper should be supplied in duplicate along with the delivery of each tamper.

## 9.0 Training & Commissioning:

9.1 Adequate training for operation and maintenance of the tamper shall be imparted at the rate of eight operators per set which shall be treated as part of commissioning.

9.2 The service engineer shall guide the operating and maintenance staff during commissioning and warranty period of tamper for proper handling and operation.

## 10.0 Marking and Packing:

### 10.1 Each tamper shall be legibly and indelibly marked with the following details:

(i) Name, contact no. and trade mark/brand of the manufacturer.

(ii) Month & year of supply.

10.2 The tamper along with tamping tools/ blades shall be packed in a suitable case/ plastic moulded durable suitcase of convenient size.

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JRE/SSE/SSRE	ARE/DTM/EDTM	PEDTM	Page no.
Prepared by:	Checked by:	Issued by:	6 of 6