



BHARAT HEAVY ELECTRICALS LIMITED
CENTRAL FOUNDRY FORGE PLANT

SHOT BLASTING MACHINE

SPECIFICATION - FT/SP/53

1.0 DESCRIPTION:

This specification governs the requirements of Shot Blasting Machine – Car Table Type.

2.0 OBJECTIVE:

Shot Blasting of castings with steel shots (SS-1400) for cleaning of casting surface from fused sand and oxide scales to make the casting surface smooth enough without indentation, with surface finish 3S1 of BN1F359 according to EN1370, ready for ultrasonic testing. The castings are made of plain carbon steel, Creep resistant steel and stainless steel where surface hardness is in between BHN 170 to BHN 250.

3.0 SCOPE:

Scope of supply includes design, manufacture, supply, erection and commissioning of the Shot Blasting Machine at our works. The technical and general requirements of the machine are given below.

4.0 TECHNICAL REQUIREMENTS

4.1 CAPACITY

Capable to shot blast casting weighing 60MT – single piece.

4.2 SIZE:

The table and chamber should accommodate casting of size 6M x 6M x 4M-height.

4.3 TABLE

Rotating type, 6M (min.) in diameter, made of abrasion resistant Manganese Steel. RPM of table should be designed in such a way that total cleaning of casting surface from fused sand and oxide scale is possible for the particular placement position of casting on table. Height of table shall be 700mm to 800mm from ground level. Job shall be loaded/unloaded from the table using EOT crane.

4.4 TABLE MOVEMENT :

Casting loading & unloading on the table, shall be done when the table is outside the chamber, with the help of EOT crane. Rotation of table shall be by Rack & Pinion drive.

4.5 WORK CAR DRIVE:

As per calculation. Front and Rear wheel drive diagonally with transverse speed of 4M/minute.

4.6 SHOT BLASTING CHAMBER:

The chamber shall be made of steel structural fabrication of 6 mm plate with 12mm thick Manganese steel in-line liners. The floor shall be made of perforated MS sheet of 12 mm thick. The chamber should have one access door on one side opposite to blasting wheel mounting. One vision window of 350 mm x 350 mm size shall be provided. The chamber shall have suitable air vents and exhaust boxes. Light boxes shall be in top ceiling with necessary lighting for uniform illumination in chamber.

4.7 CHAMBER DOOR:

It shall be made of fabricated steel structure inside rubber lined. The door shall be sliding type, motor driven, chain and sprocket drive and should be leak proof for steel shots during shot blasting operation.

4.8 BLASTING WHEEL:

25 RLM 195 of 19.5 inch diameter wheel or equivalent.

4.9 ABRASIVE FLOW :

150kg / wheel / min or more.

4.10 ABRASIVE VELOCITY:

74meter / sec or more.

4.11 POWER OF WHEEL MOTOR:

30HP x adequate nos. of wheels located on side and top of the chamber.

4.12 ABRASIVE RECYCLING SYSTEM:

Consisting of helicoids bottom screw conveyor, elevator, helicoids upper screw conveyor, CFS separator with rotary screen, abrasive hopper with feed pipes

and soundabrator abrasive control valves, platform for maintenance of elevator and separator. Abrasive storage hopper shall be fitted with level sensor such that fall in level of abrasive will be indicated automatically on the pane so that fresh charge of shots can be added.

4.13 MAINTENANCE PLATFORM:

Superstructure with platform, railing and ladder for maintenance of elevator, separator and side blasting wheels.

4.14 TOUCHUP FACILITY:

Touch up to be carried out manually inside the blast chamber by one number pressure blast unit. For this facility, price to be quoted separately.

4.15 DUST COLLECTOR:

Pulse-jet type with exhaust fan. The dust controller should be provided to exhaust the dust generated in the blasting zone and also from the elevator separator etc. Dust emission unit from dust collector should be 50 mg/m^3 of exhaust air. This system should be in line with requirements of ISO18000

4.16 CONTROL PANEL:

An electrical control panel and operation dust shall be provided outside the chamber for total shot blasting operation. Each motor shall be provided with on/off switch (push button) and indicating lamp, emergency stop arrangement should also be there. The electrical interlocking shall be provided in the control panel so that the complete operation can be in sequence. However, a manual sequence shall also be given so that each individual motor can be operated separately.

4.17 ELECTRICALS

The electrical motors should be enclosed and fan cooled, 3 phase $415 \pm 6\%$ volts AC 50Hz.

The class of protection should be IP55 conforming to IS 4691.

Make of the motor shall be Siemens/NGEF/Kirlosker/ABB.

Starter shall be heavy duty L&T or Siemens make.

All geared motor shall be PBL/Optimex make.

4.18 DUCTING

3.15 mm thick MS fabricated

4.19 SOUND LEVEL

Sound level should not exceed 90 dB

5.0 GENERAL REQUIREMENTS

5.1 PAINT:

The total shot blasting machine shall be grey colour spray painted.

5.2 GUARANTEE:

The equipment is to be guaranteed against defective workmanship, design, material and smooth and efficient operation of 24 months from the date of commissioning.

5.3 PACKING

The machine shall be dispatched in suitable packing with identification, to avoid damage during transit, handling & storage.

5.4 SPARES

Toolkit and spares required for smooth operation of the equipment for two years shall be provided.

5.5 COMMISSIONING :

The supplier shall erect, commission and demonstrate the satisfactory performance of the machine at CFFP/BHEL. The supplier shall depute their representative for erection and commissioning and conducting trial run of the machine.

5.6 SAFETY:

The plant shall be designed for complete safety of the operator under normal working condition.

6.0 DETAILS TO BE INCLUDED IN THE OFFER:

Following details are to be included while submitting the offer

- (a) General Arrangement drawings
- (b) Electrical load.
- (c) Ducting system.
- (d) Shot consumption rate/wheel.
- (e) Initial requirement of steel shot.
- (f) Quality and quantity of compressed air.
- (g) Space requirement and sketch for foundation work.
- (h) Abrasive flow/min/wheel
- (i) Abrasive velocity
- (j) Track guage

- (k) Calculation sheet for selection of motor, gear boxes and size of various equipments.

7.0 DOCUMENTS TO BE PROVIDED WITH SUPPLY:

Three sets of documents as given below shall accompany the machine.

- a) Operation and Maintenance manual.
- b) Electric Circuit diagram.
- c) Assembly drawing / diagram showing placement of components / spare parts list along with make, rating & specification.
- d) Details of bought out items with their specification, addresses of vendors.
- e) Test certificate.
- f) Foundation Drawing.
- g) Any other relevant information

8.0 INSPECTION, DEVIATION AND REPLACEMENT

- 8.1 The equipment shall be inspected at CFFP, BHEL which will be binding on supplier. If the equipment received at CFFP is not found in accordance with the requirements, it shall be rejected.
- 8.2 BHEL reserves the right to inspect equipment at site before despatch. The supplier shall give prior intimation in such case. The supplier shall submit a copy of test certificate in advance of the equipment offered for inspection. However inspection at BHEL, CFFP shall be final. The supplier shall offer BHEL representative all reasonable test facilities without charge to satisfy the latter that the equipment is being furnished in accordance with this specification.
- 8.3 For any deviation from the specification demanded by the supplier, prior approval of BHEL must be obtained in writing.

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