

**TECHNICAL SPECIFICATION FOR ONE NO. "SAND BLASTING MACHINE"**  
**SPECIFICATION NO. :-EMT-6828**

Sl. No.	DESCRIPTION OF BHEL REQUIREMENT	REQUIRED	OFFERED	DEVIATION
1.0	<b>PURPOSE :-</b> During the manufacturing of 800 MW stator winding bars, copper contact sleeves/connection clamps are brazed on both ends of bars. Sand blasting machine will be used to clean these contact sleeves/connection clamps after brazing operation. <b>Note: - Vendor can examine the existing Sand blasting Machine under operation at BHEL works, if necessary, before submitting their offer.</b>			
2.0	<b>SCOPE :-</b> The scope of supply includes the design, manufacturing, supply, erection, commissioning and job proving of Sand blasting Machine to the satisfaction of BHEL, at BHEL Haridwar works.	01 No.		
3.0	<b>JOB DESCRIPTION:-</b> Stator winding bars of 800 MW TG consists of hollow steel conductors and solid copper conductors. Contact sleeves/connection clamps are brazed at the ends of bars. Contours of bar are very complex. Drawing no-01350701035 (sheet 1 & 2) are attached as annexure-1 for better understanding. Also photograph of 800 MW stator winding bar is attached as annexure-2. Stator winding bar will be inserted in the sand blasting machine from side doors cut outs such that contact sleeve/connection clamps remain at desired location inside the machine and shall remain stationary thereafter. Nozzle of sand blasting machine shall be maneuvered to clean all the four sides of contact sleeves/connection clamp. During the operation bar shall be hanged on crane by a lifting beam (BHEL scope). Only one end shall be sand blasted at a time.			
4.0	<b>TECHNICAL SPECIFICATION OF SAND BLASTING MACHINE:-</b>			
4.1	Sand blasting Machine shall work on Induction Suction Principle.			
4.2	Dimension of blast cabinet/chamber:- <b>Height:-900mm(approx.)</b> <b>Width:-1200mm(approx.)</b> <b>Depth:-900mm(approx.)</b> Blast cabinet height from ground: - 1000 mm (approx.).			

4.3	Blast Nozzle lining shall be of Tungsten Carbide.			
4.4	Blast Nozzle orifice shall be 8mm or better.	Vendor to confirm		
4.5	Dust collector fan motor:- 3-phase, 1.5 HP or better, motor capacity: 800 CFM or better			
4.6	Abrasive storage capacity 40 liters or more.			
4.7	Filter bags to collect dust particles.			
5.0	<b>DESCRIPTION OF SAND BLASTING MACHINE:-</b>			
	Sand blasting Machine shall consist of following major items:-			
5.1	<b>Blast Cabinet :</b> Blast cabinet shall be a closed loop system that shall allow the operator to blast and recycle the abrasive (sand). This blast cabinet consists of mainly following components.			
5.1.1	<b>Cabinet:</b> Cabinet shall be a closed chamber in which operator blasts the contact sleeves/connection clamp arrangement from outside by placing his arms in gloves attached to glove holes on the cabinet. For viewing the job a view window will be provided on the cabinet. Suitable light arrangement inside cabinet should be provided for viewing the job during operation. Provision for turning the blast on and off should be provided using a foot pedal or treadle.			
5.1.2	<b>The sand blasting system:</b> Suitable sand blasting system (as per clause no.- 4.3 & 4.4) shall be provided for proper travelling of sand particles through a nozzle that directs the particles towards the surface or work-piece. Speed of sand particles travelling through the nozzle should be kept such as to clean the work piece surface with finish/roughness SA2½ or better. Details of sand are mentioned below:- Size:- 0.15 – 0.25 mm Hardness:- 515 Kg/mm2 (Knoop) Density:- 2.5 g/cm3 Specific Gravity:- 2.45-2.50 Shape:- Spherical Color:- clear/white Free silica:- 0 % Compressive strength:- 36,000 psi <b>Note: - BHEL shall provide compressed air of 5 bar pressure having traces of moisture. Vendor shall provide suitable system to make</b>	Vendor to furnish detail in the offer.		

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	compressed air moisture free and fit for application.			
5.1.3	<b>The sand recycling system :</b> Suitable arrangement shall be provided for reusing the sand after its blasting on the contact sleeve/connection clamp.			
5.2	<b>Side Doors:-</b> The side doors of the blast cabinet shall consist of rectangular cut out with removable covers for insertion of Stator winding bar into the Blast Cabinet. The dimension of cut out shall be 450X450 mm (approx.) at suitable place on the doors so as to insert stator winding bar inside cabinet with ease for contact sleeve/connection clamp cleaning. Suitable arrangement for covering the cut out should be provided during operation. Note: - (1) stator winding bars are of complex contour (refer attached annexure). Cut out to be made in the side doors may need final adjustment during trial and job proving at BHEL works with actual stator winding bars. (2) Stator winding bar once inserted in machine cannot be moved. Nozzle should be maneuver to sand blast the stationary contact sleeve/connection clamps.			
5.3	<b>Dust Collector :</b> Suitable capacity and reputed make dust collector (as per clause no.-4.5, 4.6 & 4.7) complete with 5.5 mtr. Long flexible hose and collection nozzle, shall be provided for effective extraction and collection of sand dust particles.			
6.0	<b>General Arrangement Drawing :</b>			
6.1	Vendor shall furnish the General Arrangement Drawing for Sand Blasting Machine, along with the offer.	Vendor submit	to	
6.2	<b>Vendor shall also submit the General Arrangement Drawing of Sand Blasting Machine for BHEL approval, within 2 weeks after placement of Purchase Order.</b>			
7.0	<b>FOUNDATION DRAWING :</b>			
7.1	Foundation drawing (if any) shall be supplied from the vendor well in advance before dispatch of sand blasting machine.	Vendor confirm	to	
7.2	BHEL will carry out civil foundation work as per supplier drawing only.			

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<b>8.0</b>	<b>SPARES</b>			
8.1	Following spares for 2 years trouble free operation shall be provided along with recommended list of spares (if any):-	Vendor to confirm and furnish the list of spares in the offer.		
	<b>Description</b>	<b>Qty.</b>		
	Sand	200 Kg (as per clause 5.1.2)		
	Filter Bag	2 No.		
	Flexible hose pipe	2 no. (5.5 meter long)		
	Blast Nozzle	1 No.		
	Hand gloves	4 pairs		
	Vision glass	1 no		
<b>9.0</b>	<b>PRE-ACCEPTANCE OF SAND BLASTING MACHINE AT VENDOR'S WORKS :</b>			
9.1	Sand Blasting Machine shall be inspected by BHEL engineers on following points at vendor's works :-	Vendor To confirm		
9.1.1	Overall Dimensions of each components, make and specification of motors and other components with reference to <b>approved General Arrangement Drawing (sl. no. 5.2)</b>			
9.1.2	All operations of Sand Blasting Machine to be checked by performing the cleaning operation on copper pieces. Vendor shall arrange the copper pieces for PDI trials. Surface finish/roughness SA2½ or better to be demonstrated during PDI.			
<b>10.0</b>	<b>ENVIRONMENTAL CONDITION:-</b>			
10.1	Ambient Temperature : 4°C to 45°C			
10.2	Relative humidity- 30 to 90 %			
10.3	Voltage fluctuation- +/- 15 %			
<b>11.0</b>	<b>POWER SUPPLY</b>			
11.1	BHEL will provide <b>input power supply 3 phase, 3 wire, 415 + / - 15% volt, 50 + / - 3% Hz</b> to Isolator Switch (BHEL scope) nearby Sand Blasting Machine. <b>Cable connection (approx. 20 meters) from the supply to the Sand Blasting Machine will be in the scope of Vendor.</b>			
<b>12.0</b>	<b>ERECTION, COMMISSIONING &amp; JOB PROVING :-</b>			
12.1	Erection, Commissioning and job proving of the machine shall be done by the vendor on two numbers of stator winding bars at BHEL, Haridwar works achieving surface finish/roughness of SA2½ or better.	Vendor To confirm		

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	The machine will be finally accepted after successful performance at BHEL Haridwar works. <b>Note:</b> - During commissioning man power support if needed, same will be provided by BHEL.			
12.2	During commissioning if any item is damaged / not functioning, vendor shall replace the same without any cost to BHEL.	Vendor confirm	to	
12.3	<b>First filling of all oils, grease etc. shall be in the vendor's scope of supply.</b>	Vendor confirm	To	
<b>13.0</b>	<b>NOISE LEVEL</b>			
13.1	Maximum noise level of the grinding system must be below 85 dB (A), one meter away from the system with correction factor for background noise.			
<b>14.0</b>	<b>OPERATION &amp; MAINTENANCE MANUAL :</b>			
14.1	Vendor shall furnish 3 sets of detailed Operation & Maintenance manual with the consignment. The operation & maintenance manual should contain drawings, make and specification of components used in Sand Blasting Machine.			
<b>15.0</b>	<b>GUARANTEE :-</b>			
15.1	Vendor shall furnish 12 months guarantee of Sand Blasting Machine from the date of commissioning.	Vendor confirm	To	
15.2	Any spare required during guarantee period shall have to arrange by the vendor free of cost (up to BHEL Haridwar stores) and duty levied has to be borne by the vendor.	Vendor confirm	to	

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QUALIFYING CONDITIONS FOR SAND BLASTING MACHINE:-				
DESCRIPTION OF BHEL REQUIREMENT	TO BE SUPPLIED/ CONFIRMED/ SUBMITTED BY	OFFERED	DEVIATION	REMARKS
<p>Only those vendors should quote who have supplied &amp; commissioned at least one sand blasting machine of fan motor capacity minimum 1H.P. with dust collection system for cleaning of metals in the past fifteen years (on the date of opening of Tender) and referred sand blasting machine is presently working satisfactorily for more than one year after commissioning. (on the date of opening of Tender).</p> <p>The following information should be submitted by the vendor about the companies where similar sand blasting machine have been supplied. This is required from all the vendors for qualification of their offer.</p>	Vendor to accept & confirm.			
1. Name of the customer / company where referred sand blasting machine is installed.	Vendor to inform.			
2. Complete postal address of the customer.	Vendor to inform.			
3. Month & Year of commissioning	Vendor to inform.			
4. Parameters of sand blasting machine supplied and application for which the sand blasting machine is supplied.	Vendor to inform.			
5. Name and designation of the contact person of the customer.	Vendor to inform.			
6. Phone, FAX no. and email address of the contact person of the customer.	Vendor to inform.			
7. Performance certificate from the customers regarding satisfactory performance of sand blasting machine supplied to them (Original Certificate or Through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.	Vendor to submit.			
8. BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	Vendor to accept & confirm.			

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