

**Bharat Heavy Electricals Limited**

(A Government of India Undertaking)

Electronics Division

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Tender document for the supply of WAVE SOLDERING MACHINE**R F Q Number : TRSM900002**

Tender Qty : ONE Number

Tender Due Date and Time : 14.01.2008 13.00 Hrs

Tender Opening Date and Time : 14.01.2008 13.30 Hrs

Place of opening of Tender : SA – MM Conference hall

Scope:

Supply ,Installation & commissioning of the Wave soldering machine for wave soldering of PCB assemblies.

1. Two part Bid - Tender shall be submitted in two parts :

- a. Part I – Techno commercial bid without prices.
- b. Part II – Price bid

2. Earnest Money Deposit : EMD of Rs 1,00,000/- (rupees one lakh only) shall be submitted in the form of DD along with the bid. EMD in the form of DD / Pay order only is acceptable and any other form is not acceptable and the bid is liable for rejection. EMD amount doesn't carry any interest. The same will be converted as Security Deposit for the successful bidders and for unsuccessful bidders the same will be refunded after finalization of the order. For successful bidders EMD will be refunded after submission of PBG.

3. Delivery Period: Equipment shall be delivered, within 4 months from the date of placement of technically & commercially clear purchase order.

4. Terms and conditions:

1. All the Bidders shall meet the **pre-qualification criteria** and Comply with **Technical Specification** mentioned in this specific tender.
2. Indian Bidders are required to comply with the **general terms and conditions** as per SA – 01 (Annexure –I)
3. Foreign Bidders are required to comply with the **general terms and conditions** as per SA – 02. (Annexure –II)

Pre qualification criteria

1. The vendor shall be an Original Equipment Manufacturer (OEM)
 - a. Based in India
 - b. Foreign OEM with Authorized Indian dealer(s) / representative(s) for sales & service. The authorization letter for the dealer/ representative shall be provided.
 - c. Offer can be submitted by the OEM or their authorized dealers in India along with an authorization letter. However Purchase Order will be placed on the lowest technically acceptable bidder on the OEM only.
 - d. If the offer is from an authorized representative in India , the Indian representative cannot quote for the same equipment from 2 or more different OEM's
2. The offer shall be only for new equipment and not for any refurbished / used equipment.
3. All the parts used in the machine shall also be new and not used / refurbished ones. A declaration to the above effect to be furnished.
4. The vendor should have already supplied and installed 5 nos. of similar machines in India and operating satisfactorily for atleast one year during the last three years. The details of the customers with contact details, machines installed, date of installations etc. to be provided.
5. The vendor shall be in a position to provide service and spares support for the installations in India.
6. The vendor or their authorized service representatives should have trained engineers in India for commissioning & service for the offered equipment.
7. The vendor shall be in a position to undertake AMC for the equipment with BHEL after the expiry of the warranty/ guarantee period either directly or through a service representative. The vendor should have successfully completed AMC for similar machines for atleast one year in India and necessary proof to be furnished.
8. The vendor shall arrange for a demonstration of the machine or a similar system operating in India, if required by BHEL.
9. The vendor shall furnish a comprehensive warranty for atleast 12 months from the date of commissioning or 18 months from the date of delivery, whichever is early.
10. The vendor shall guarantee the performance of the equipment for atleast 12 months from the date of commissioning.

NOTE:

1. Pre qualification will be carried out based on the details furnished by the vendor / feedback from their customers / inspection of the company / product if required by BHEL and at its sole discretion.
2. The Pre qualification criteria are mandatory requirements and the technical bids will be evaluated only when the Pre Qualification criteria are met.

PS No. PS-202-SMT-701

A. Scope:

Supply ,Installation & commissioning of the Wave soldering machine for wave soldering of PCB assemblies as per the following specifications.

B. Technical Specifications:

The offer shall be corresponding to the parameters under the specifications below or better. Point wise compliance to the following specification is required

SI No	PARAMETER	REQUIREMENT
A BASIC PARAMETERS		
1	Maximum PCB Width	450mm
2	PCB thickness	0.8 to 3.2 mm
3	PCB top side clearance	Minimum 75 mm
4	Air Pressure	Less than 6 bar
5	Compatibility	SMEMA
6	Mode of transport	Carrier frames
7	Maximum length of the machine without extensions	4.5 metres with fluxer , cooling and without loading & unloading extensions
8	Power Requirement	3 phase 415V 50 Hz.
9	Environmental conditions for operation	Ambient Temperature upto 40 deg C , RH upto 95 %
B CONSTRUCTION & CONVEYOR SYSTEM		
1	Construction	Modular construction made of steel
2	Conveyor system	a)Belt conveyor b)System for carrying PCB Frames c) The conveyor angle may be adjustable between 6 and 8 degree with electrical adjustment
3	Controls	Individual controls for setting the speeds of various modules i.e. fluxer, preheating and solder modules with interlocks.
4	Conveyor width	Variable and electrically adjustable upto 600 mm Front fixed and rear adjustable.
5	Direction	Left to Right
6	Conveyor speed	Programmable up to about 2.2m / min
7	Viewing	Glass windows on sides for complete view with lighting
8	Loading	Loading extension /Extension conveyors of 1 metre to be provided
9	Unloading	Unloading extension /Extension conveyors of 1 metre to be provided

C FLUXER UNIT		
1	Type of fluxer	Spray fluxer
2	Fluxer Controls	a) Options to control the volume and pressure of application of flux
		b) Reciprocating spray system
		c) Air atomizing with self cleaning nozzles to be provided.
		d) Options to program the spray area
		e) Appropriate flux & flux fumes management system with exhaust & filters to be provided
		f) Interlocks for area of fluxing with board sensors.
3	Features	a) Flux container of capacity 10 litre or more
		b) quick change facility for spray nozzles alongwith additional spray nozzles
		c) Slide out fluxer module
		d) Stainless steel removable cover for protection of underneath floor
4	Capability for different types of flux	The fluxer shall have the capability to handle different types of fluxes , viz, rosin based, no clean , water based, VOC free etc.
D PREHEATING UNIT		
1	Heating zone	a) Combination of a minimum 5 preheat zones (IR/ Convection/ Quartz)
		b) Individual controls for each zone
		c) Temp range to take care of lead free soldering above 300 deg C
		d) Appropriate enclosure of preheat zone
		e) Modular & Drop down preheaters for easy maintenance.
		f) reflection tunnels
		g) total length less than 1.5 m.

E SOLDER UNIT		
1	Solder wave & Nozzles	a)Dual wave -Chip and Delta waves b)Compatible for soldering SMD chip components c) Both the nozzles to be lead free compatible d) Options to control the height of both waves e) Extra set of nozzles. f) Interlocks for solder wave on/ off with board sensor to be provided.
2	Solder Tank	a) To be Lead free compatible capable of withstanding above 300 deg C. b) Options to electrically adjust the height of solder bath c) Quick change roll out solder bath to be provided d) Solder tank leveling controls to be provided e) Shall have safety interlocks f) Solder bath capacity of a minimum of 350 kgs of tin-lead solder alloy g) suitable solder bath level controls/indicators to be provided
3	Exhaust system	Suitable provision for Exhaust to be provided. The exhausts for fluxer and solder unit to be separate. The details of the exhaust requirements to be clearly spelt out.
4	Nitrogen Inertion	a)Localized inertion of nitrogen for solder unit for dross reduction i.e. Nitrogen Hood b)Appropriate controls for monitoring and controlling the N ₂ flow
5	Dross control	a)Suitable dross control systems to be provided b)Suitable dross cleaning systems to be provided
6	Post wave Cooling	Suitable cooling system with exit conveyor to be provided at board exit after wave.
7	Dual capability between Lead free and tin-lead soldering configuration	One set of solder pot, nozzles compatible with lead free soldering to be provided for quick change over between lead free & tin lead soldering

F	CONTROL UNIT	
1	Control system	a) Completely programmable PC / micro processor based control system with suitable display
		b) PCB dimensions Length & width shall be programmable.
		c) Suitable interfaces to control the fluxing , conveyor, preheater and solder units
		d) Machine diagram, error messages display, maintenance programs on menu
		d) 100 soldering programs storage capacity
		e) Closed loop control system with all stages / functions
		e) Password protection to avoid unauthorized access to programs
		e) Interfaces for either machine host computer or external PC , barcode reader and printer
		f) Options for tapping the machine parameters for connection to an external machine like loader and unloader
		g) Interlock for machine starting with exhaust system on/ off
		h) Operational and process data recording system
		i) Necessary software / Display to be provided for graphical visualization of operational parameters
2	Safety	a) Suitable Multi color Signal tower to be provided b) Emergency stop to be provided at suitable locations c) Safety interlocks to be provided as per International standards
G	UPS	The machine shall have an in – built UPS for the controllers and conveyors for graceful shut down.
H	Spares	
	O & M Spares	Operational and Maintenance spares for 2 years of operations to be provided.
	Tools	All necessary tools for operation & maintenance to be provided.
	Qualitative tools	Necessary qualitative tools like glass plate to be provided.
	Solder frames	2 nos of universal solder frames to be provided

C. Details to be furnished along with the technical offer

1. Equipment parameters with brief explanation of features.
2. If more than one model is quoted, separate offer with complete technical details shall be submitted.
3. Additional Accessories, which will enhance the performance of the system, shall be quoted separately with price break up.
4. A clauses wise deviation, if any, has to be brought out clearly. If there are no deviations, the vendor has to positively certify clause-wise compliance to the specifications.
5. The complete technical information and catalogue shall be given.
6. Authorisation letter from the OEM to be provided , if applicable.
7. Details of authorized service agents in India to be furnished
8. List of recommended spares for maintenance purposes to be indicated
9. Reference List of customers in India & worldwide to be furnished.

D. Documents to be furnished along with Equipment

1. Operation, Maintenance, Service & spare parts manual have to be supplied along with the equipment
2. Pre-shipment Calibration certificates, if any shall be furnished. The subsequent calibration process and periodicity shall be furnished along with the authorized calibration agencies.

E. General Terms:

1. Supplier shall guarantee for one year of trouble free performance of the instrument from date of installation.
2. The equipment and accessories shall carry comprehensive warranty of one year from the date of installation including spares and service.
3. Training of the operators to be provided at BHEL / EDN for the operations and maintenance of the machine.
4. The requirements of civil , electrical , compressed air connections etc. for the machine needs to be provided.
5. Terms of Annual maintenance contract to be indicated.