

### Request for quote and specifications of - **AUTOMATIC DIE BONDING MACHINE**

- The GEECI (Gallium Nitride Ecosystem Enabling Centre and Incubator) at SID-Indian Institute of Science is seeking bids from qualified industries for **AUTOMATIC DIE BONDING MACHINE**.
- Companies need to submit two bids, a technical bid and a commercial bid, in two separate sealed envelopes. The bids should be submitted no later than 21 days from the date of posting of this tender, as listed on the website date/time stamp and by 5 pm on the 21st day or next weekday in case the 21st day falls on a weekend or a national holiday.
- Both technical and commercial bids should be addressed to “The Chief Executive, SID, IISc, Bangalore 560012.”
- The envelopes should be addressed to “Prof. Srinivasan Raghavan, CeNSE, IISc, Bangalore, 560012” and submitted to the office at CeNSE, IISc in Room No. GF 15 between 9 am and 5 pm.
- All questions regarding this tender should be addressed to Prof. Srinivasan Raghavan at the email address [sraghavan@iisc.ac.in](mailto:sraghavan@iisc.ac.in)
- Post such submission all vendors should send an email to [sraghavan@iisc.ac.in](mailto:sraghavan@iisc.ac.in) with the subject line: “GEECI\_Bidder’s name\_Tool Name” to intimate him of the submission within one day.
- Deviations from the technical specifications requested are allowed. Such deviations must be highlighted and justified. Their acceptance or rejection will be left to the discretion of the technical committee.
- The equipment sought will be placed at the Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science (IISc). IISc is India’s No. 1 institution on higher learning and the Centre for Nano Science and Engineering is home to one of the best academic fabs in the world.
- The technical response, corresponding to the tool being offered, should be in the form of a compliance table with at least 5 columns. Serial number in column 1. Each of the numbered technical items below should be addressed in a separate row of the table in column 2. Compliance to this requirement, in Yes/No, deviation from it and justification should be provided in the neighbouring columns 3-5. Post the opening of a hard copy of the technical bid the committee will request for a soft copy of the files for further processing. Companies should NOT mail soft copies of the files unless specifically requested for.
- Detailed technical specifications of the tool being offered should be included.
- Any additional capabilities or technical details, that you would like to bring to the attention of the purchase committee, can be listed at the end of the technical table.
- If multiple systems can fulfil the requirements, vendors can submit multiple bids.
- Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors.
- The commercial bid should be broken up to the maximum extent possible into separate items with a cost against each to enable better comparison of price for various configurations across the bidders. As an option, please provide itemized cost for any suggested accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.

## Technical Specifications - AUTOMATIC DIE BONDING MACHINE

Sl. NO.	Description & Specifications	Compliance - Yes / No	Remarks
1	<b>Application:</b> This system is required to Die bond (Precise die bonding (face up) on HMC, TO, RF packages & Flat substrate (PCB , ceramic & QFN ) etc. Type circuits which includes semiconductor chips & package. Flip chip bonding ((face down)) is also required as an optional item.		
2	The Automatic - Die bonder system features		
	Bonder should be capable to die bond in automatic mode, semi-automatic mode as well as manual mode.		
	Pattern recognition for automated pick & placement during bonding processes. Should include at least 2 CCD camera (down looking & up looking both) units along with necessary optics for die and substrate recognition.		
	Placement accuracy of 3.0um or better at 3 sigma		
	Synchronized control of all process related parameters including force, temperature, time, power, process environment, light and vision		
	Fast, modular process development with graphical user interface		
	Multipurpose system for R&D, pilot to medium volume production		
3	Die Attach Technologies		
	Adhesive Bonding		
	Thermosonic Bonding		
	Flip Chip Bonding to be quoted as an option, BGA attach & Eutectic Bonding		
4	Epoxy Dispenser features		
	Pressure/time as well as rotary micro valve (auger) type dispensing unit should be included.		
	Filled and unfilled epoxy, wide viscosity range of 30 to 1300 mPas for Auger type & 0.1 to 100 mPas for pressure/time type should be possible.		
	Different Pattern Dispensing		
	Dispensing needle - calibration tools/module should be quoted as an option.		
Epoxy stamping should be quoted as an option			
5	Wafer & Substrate spec		
	Die pick from: wafer, waffle pack, Gel-Pak should be possible		
	Wafer Size : Upto 8" or more		
	Frame size : 8" & adjustable ring for 6"		
	Waffle pack / Gel-Pak 2 "X 2" & 4" X 4"		
Die size to be die attach: 0.100 to 100 mm or more			

		Die size to be Flip chip: 1 mm to 15 mm or more		
		Die thickness: 0.05 mm - 2 mm or more		
		Wafer mapping (Specify the Formats support )		
		Substrate holder working range of 200 x 200mm or larger		
		Substrate holder working heating range of 50 x 200 °C or more		
		Capability to handle substrates of different heights		
		Max Substrate height that can be handled ( specify)		
		Full alignment of all the process		
		X- travel alignment stage of 400mm or larger		
6	Vision Alignment	Y- travel alignment stage of 400mm or larger		
		Z- travel alignment stage of 100mm or larger		
		Theta- travel alignment stage of +/- 180°		
		Wafer mapping to be quoted as an option for Ink mark reject during die pick up.		
		Pre-defined fiducial geometry & customized teaching with various working methods (Image Area, Edge Corner, Hole Finder, Circle Finder, 4 Corner Detection) for Die & substrate , Module.		
		Wafer ejector tools with universal die kit to handle dies from 1mm to 10mm.		
		Ejector to be Support ( Die for 1mm to 10MM)		
7	Ejector	Ejector need to have adjustable Z- axis ( Up & Down)		
		Ejector vacuum & eject the pin		
		Ejector tools - Calibration tools should be included.		
		Ejector tools bank - to be quoted as an option		
		Die place to: substrate, boat, carrier, PCB, lead frame & package		
8	Pick & place Tool Changer	Fully automatic tool changer		
		Pick & Place tools without heating (10 or more no of tools in tool bank ) die size 0.5 mm to 10mm		
		Pick & Place tools with heating (Pls specify the No of tools in tool bank ) die size 0.5 mm to 10mm		
		Placement accuracy of 3.0µm @ 3 sigma or better		
		Two- and four-sided collet component alignment, round, rectangular and dual-sided collets		
		Vacuum pickup with programmable vacuum sense thresholds per tool		
		Bonding force of 0.050 to 50N or better		
		Thermosonic Bonding - Frequency in range ( specify)		
		Pick & place tools - Calibration tools possible.		
		Scrub direction X & Y		
		Bond head rotation of +/- 180°		

9	Heated options	Pick up tool or bond head heated (up to 400 °C or more)		
		Dispensing needle heater to be included in optional		
		Substrate heating (up to 200 °C or more) to be included.		
10	Dispensing & stamping Tool	50 micron to 1 mm dispensing needle to be supply along with machine		
11	Epoxy & AuSn preform	Epoxy- Unimec h9890-6A, Able stik 84LMINB1 & EPO-TEK H20E PMF Syringe need to supply by OEM		
		AuSn preform supply by OEM		
12	Die Bond( Pickup Tools Size)	0.7 to 5mm Pickup tools need to supply along with machine		
		Calibration & setup tools kit		
13	Ejector Tools Size	0.7 to 5mm ejector tools & ejector pin need to supply along with machine		
		Calibration & setup tools kit		
14	<b>Software:</b>			
	Die Bonder should be loaded with relevant software covering all the types die bonding operations, die bonding parameter, data logging & analysis, Pattern Recognition Software (PRS) etc.			
	Die Bonder controller should have Integrated Windows-10 or better operating system with internal data base for data storage, with data query and data export tool.			
20	Other Optional item of the machine			
a				
b				
c				
d				

<b>Common Terms and Conditions: A separate table to be included for each of the items below in the technical bid.</b>			
I	<b>Semi Standards:</b> Technical bid should provide details of SEMI standards the tool confirms to.		
II	<b>Clean Room Compatibility:</b> The system should be compatible with better than class 1000 cleanroom environment.		
III	<b>Tool Qualification and Acceptance:</b> Commissioning shall involve demonstration of <b>AUTOMATIC DIE BONDING MACHINE</b> to the required specifications and characterized by the client within time frames as mutually agreed upon. Details of the stage wise certification protocols to be pursued for tool acceptance should be included in the technical bid. The PO will include a mutually agreed upon set of tool qualification criteria. Please list a set of acceptance tests for on-site (vendor) inspection and after installation at IISc.		
IV	<b>Tool Training:</b> The bid should include as an option the cost of training personnel on site before shipment and post installation at IISc.		
V	<b>Tool footprint and utilities:</b> A floor plan should be part of the technical bid. A list of utility requirements should be part of the technical bid. The system should be compatible with 240±10V, 50 Hz single phase or 415±20V, 50 Hz 3 phase supplies. The MINIMUM sets of utility requirements needed are provided in Table 1. If there are additional utility requirements please include them in the technical bid. Please list connector types for all utilities.		
VI	<b>Cost of Ownership and supply of spares:</b> The quote should include a listing of spares that need to be replaced periodically to ensure that the system is in operation in a stable fashion – the stability parameters being defined by the vendor and agreed to by the client – the cost of such items, the ability to guarantee their availability at this cost for a period of 5 years from the time of procurement. The aim of this exercise is to compare cost of ownerships between reactors.		
VII	<b>Maintenance:</b> The cost of an annual maintenance contract and cost of emergency technical support that may involve an engineer being on site should be quoted for in the commercial bid and addressed in the technical bid. The availability of trained engineers in India for servicing the system will be preferred and should be described in the technical bid.		
VIII	<b>Maintenance:</b> On all systems a set of basic tools required -non-standard screw or spanner head that is required for routine tool maintenance should be mentioned- for performing routine maintenance should be included.		
IX	<b>Operation &amp; Maintenance:</b> System operation, process and troubleshooting manuals and detailed drawings are a must (hard copy & soft copy both). Their inclusion must be indicated in the technical bid.		
X	<b>Online support:</b> System should have the capability for online diagnostics from a remote location in case of tool problems or tele-con with free of cost.		

XI	<b>Post sales &amp; service and Indian Presence:</b> Bidders should provide details of after sales service and support available in India. If not India, the nearest geographical location should be specified. Please provide details of the number of trained personnel in India who can service the machine, the number of tools sold in India and the corresponding number in the southern region or in Bangalore.		
XII	<b>Shipping:</b> On all systems the cost of shipping up to IISc should be included ( <b>DAP MODE</b> ).. IISc will help with customs clearance at Bangalore Airport.		
XIII	<b>Payment Terms and Conditions:</b> On all systems the payment terms should be specified in the technical and commercial proposal and is subject to negotiation. Please include your payment option. IISc would prefer to retain at least 20% of payment till instruments have been commissioned and successfully demonstrated.		
XIV	<b>References:</b> Bidders should provide details of other locations in India with similar tool installations.		
XV	<b>References:</b> Bidders should provide details of at least 3 other locations globally where similar tool installations have been deployed for device fabrication in a clean room preferably for production purposes.		
XVI	<b>Company financials:</b> Bidder shall have to submit audited accounts of financial year 2017-18, 2018-19 and 2019-20. Audited statement must be signed and stamped by qualified chartered accounted. Income Tax return for assessment year – 2017-18, 2018-19 and 2019-20.		
XVII	The following documentation should be provided. ISO9001 quality certification. CE marking confirmation.		

Eligibility Criteria :	
1	Only vendors who are compliant with the technical requirements will be considered for commercial comparison. The bid is awarded to the lowest cost vendors (referred as L1).
2	The Bidder's firm should have existence for a minimum of 5 years. (Enclose Company Registration Certificate).
3	Quote should only from Indian Original Equipment Manufacturer (OEM).
4	The quotations should be on For-IISc Bangalore basis in INR only.
5	The Bidder should belong to either class 1 or class 2 supplier distinguished by their "local content" as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter. a) Class 1 supplier: Goods and services should have local content of equal to or more than 50%. b) Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.
6	This tender will only apply entertain Class 1 or Class 2 suppliers. Vendors must provide a self-declaration of what Class they belong to.
7	Mention GST separately.
8	GST/other taxes, levies etc., are to be indicated separately. The BIDDER should mention GST Registration and PAN in the tender document.
9	The bidder should sign and submit the declaration for Acceptance of Terms and Conditions
10	The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given.
11	The products should be based on latest technology for the specific requirement.
12	Incomplete bids will be summarily rejected.

Details to be provided in addition to other utility requirements the tool may require. If not applicable mark as NA: Not applicable.

Tool dimensions				Electric		Chilled water		Gases							Exhaust	Thermic load							
L (mm)	B (mm)	H (mm)	Sq. Metre	kW	kVA	kW	l/h	slpm	slpm	slpm	slpm	slpm	slpm	slpm	slpm	m <sup>3</sup> /h	kW						
Tool Foot Print, (LXBXH)				Power consumption average		Cooling capacity maximum		UHP Nitrogen		UHP Hydrogen		He		Oxygen		Regular Nitrogen		Argon		Forming Gas		Thermic load to clean room	
			Area		Peak power		Process Cooling Water																