



Request for quote and specifications for Photoresists for Electron beam lithography for use in device processing of III-nitride technology

- The GEECI (Gallium Nitride Ecosystem Enabling Centre and Incubator) at SID-Indian Institute of Science is seeking bids from qualified industries for Photoresists for EBPB 5051 tool. The specifications for these consumables are listed in Table 1.
- 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
- Post such submission all vendors should send an email to 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 consumable 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 Photo resists and other chemicals being offered should be included. Specifications must include the shelf life and lead time of the chemicals being offered.
- 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.
- Vendors are encouraged to highlight the advantages of their consumables over comparable consumables 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.

Table 1. Technical Specifications for Photoresists for E-beam Lithography

S. No.	Name of Photo resist	Chemical Specification	Quantity
1	PMMA 950 C3	Type: Positive Developer: MIBK+IPA Bake Temperatures: 80 to 180C Thickness (um): 0.2um to 0.4um (with Spin Curve, Uniformity <3% on 4" wafer) Resist Profile:85 to 90 degrees (with a good control on angle) Adhesion: Self to Si, SiO ₂ , Pt (i.e., resist should have good adhesion with Semiconductors, Insulators, and metals) Primer: NA Removers/Strippers: Non-toxic Room temperature to <80C Shelf Life: Minimum 6 Months (12 months preferred) Resolution(um): Ebeam (80nm) Ebeam Dose: 50–500 $\mu\text{C}/\text{cm}^2$ Relevant Documents: MSDS, TDS	12Litre (minimum supply capacity per year)
2	PMMA 950 C6	Type: Positive Developer: MIBK+IPA Bake Temperatures: 80 to 180C Thickness (um): 0.8um to 2um (with Spin Curve, Uniformity <3% on 4" wafer) Resist Profile:85 to 90 degrees (with a good control on angle) Adhesion: Self to Si, SiO ₂ , Pt (i.e., resist should have good adhesion with Semiconductors, Insulators, and metals) Primer: Removers/Strippers: Non-toxic Room temperature to <80C Shelf Life: Minimum 6 Months (12 months preferred) Resolution(um): Ebeam(80nm) Ebeam Dose: 50–500 $\mu\text{C}/\text{cm}^2$ Relevant Documents: MSDS, TDS	12Litre (minimum supply capacity per year)

3	PMMA 950 A2	<p>Type: Positive Developer: MIBK+IPA Bake Temperatures: 80 to 180C Thickness (um): 0.4um to 1.5um (with Spin Curve, Uniformity <3% on 4" wafer) Resist Profile: 85 to 90 degrees (with a good control on angle) Adhesion: Self to Si, SiO2, Pt (i.e., resist should have good adhesion with Semiconductors, Insulators, and metals) Primer: Removers/Strippers: Non-toxic Room temperature to <80C Shelf Life: Minimum 6 Months (12 months preferred) Resolution(nm): Ebeam (80nm) Ebeam Dose: 50–500 $\mu\text{C}/\text{cm}^2$ Relevant Documents: MSDS, TDS</p>	12Litre (minimum supply capacity per year)
4	EL 9	<p>Type: Positive Developer: MIBK+IPA Bake Temperatures: 80 to 180C Thickness (um): 0.3um to 0.6um (with Spin Curve, Uniformity <3% on 4" wafer) Resist Profile: 85 to 90 degrees (with a good control on angle) Adhesion: Self to Si, SiO2, Pt (i.e., resist should have good adhesion with Semiconductors, Insulators, and metals) Primer: NA Removers/Strippers: Non-toxic Room temperature to <80C Shelf Life: Minimum 6 Months (12 months preferred) Resolution(nm): Ebeam (80nm) Ebeam Dose: 50–500 $\mu\text{C}/\text{cm}^2$ Relevant Documents: MSDS, TDS</p>	
5	Ma-N2401	<p>Type: Negative Wavelength(nm): UV sensitive and Ebeam Developer: MIF726 Bake Temperatures: 80 to 180C Thickness (um): 0.1um to 0.3um (with Spin Curve, Uniformity <3% on 4" wafer) Resist Profile:85 to 90 degrees (with a good control on angle) Adhesion: Self to Si, SiO2, Pt (i.e., resist should have good adhesion with Semiconductors, Insulators, and metals)</p>	12Litre (minimum supply capacity per year)

		<p>Primer: NA Removers/Strippers: Non-toxic Room temperature to <80C Shelf Life: Minimum 6 Months (12 months preferred) Resolution(nm): Ebeam (50nm) Relevant Documents: MSDS, TDS</p>	
6	Ma-N2403	<p>Type: Negative Wavelength(nm): UV sensitive and Ebeam Developer: MIF726 Bake Temperatures: 80 to 180C Thickness (um): 0.1um to 0.3um (with Spin Curve, Uniformity <3% on 4" wafer) Resist Profile:85 to 90 degrees (with a good control on angle) Adhesion: Self to Si, SiO2, Pt (i.e., resist should have good adhesion with Semiconductors, Insulators, and metals) Primer: NA Removers/Strippers: Non-toxic Room temperature to <80C Shelf Life: Minimum 6 Months (12 months preferred) Resolution(nm): Ebeam (50nm) Relevant Documents: MSDS, TDS</p>	12Litre (minimum supply capacity per year)
7	Ma-N2405	<p>Type: Negative Wavelength(nm): UV sensitive and Ebeam Developer: MIF726 Bake Temperatures: 80 to 180C Thickness (um): 0.1um to 0.5 um (with Spin Curve, Uniformity <3% on 4" wafer) Resist Profile:85 to 90 degrees (with a good control on angle) Adhesion: Self to Si, SiO2, Pt (i.e., resist should have good adhesion with Semiconductors, Insulators, and metals) Primer: NA Removers/Strippers: Non-toxic Room temperature to <80C Shelf Life: Minimum 6 Months (12 months preferred) Resolution(nm): Ebeam (50nm) Relevant Documents: MSDS, TDS</p>	12Litre (minimum supply capacity per year)

8	Discharge H2O	Type: Anti-charging polymer solution Thickness (um): 25nm to 50nm (with Spin Curve and Uniformity data) Sheet resistance: 100 to 300Mohm/Sq. Removers/Strippers: Water or IPA Shelf Life: Minimum 12 Months (24 months preferred)	12Litre (minimum supply capacity per year)
9	AR 600-60	Type: Stopper Shelf Life: Minimum 6 Months (12 months preferred) Relevant Documents: MSDS, TDS	12Litre (minimum supply capacity per year)
10	Surpass 3000	Type: Adhesion promoter Adhesion: Self to Si, SiO ₂ , Pt (i.e., resist should have good adhesion with Semiconductors, Insulators and metals) Shelf Life: Minimum 6 Months (12 months preferred) Relevant Documents: MSDS, TDS	12Litre (minimum supply capacity per year)
11	Surpass 4000	Type: Adhesion promoter Adhesion: Self to Si, SiO ₂ , Pt (i.e., resist should have good adhesion with Semiconductors, Insulators and metals) Shelf Life: Minimum 6 Months (12 months preferred) Relevant Documents: MSDS, TDS	12Litre (minimum supply capacity per year)
12	Ma-D 525	Surfactant – Yes Compatibility – I-line and DUV (248nm) resists. Ready to use. Metal iron free (MIF) TMAH based Grade – VLSI Shelf Life: Minimum 6 Months (12 months preferred) Relevant Documents: MSDS, TDS	60Litre (minimum supply capacity per year)



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Terms and conditions:

1. Vendors can quote for a subset of the consumables above.
2. Shipping: On all the items the cost of shipping up to IISc should be included. IISc will help the shipping company to take care of the customs clearance at Bangalore Airport. Please include your payment option. IISc would prefer payment after receipt of the consumables.
3. References: Bidders should provide details of other locations/users across the globe where similar material was delivered.
4. The lead time for the delivery of the material should preferably be less than 4 weeks from the date of receipt of our purchase order. The smallest lead time will be appreciated. Else, the lead time should be specified.
5. The validity period of the quotation should be 90 days at least.
6. The vendor should be flexible with parts delivery. We may spread the entire requirement into 3 years and ask for delivery in lots.
7. The quantity of the consumables to be purchased may change which is left to the discretion of the technical committee.

Common Terms and Conditions: A separate table to be included for each of the items below in the technical bid
SEMI Standards: The technical bid should include details of the SEMI standards the tool confirms to.
Clean Room Compatibility: The system should be compatible with better than class 1000 cleanroom environment.
Shipping: On all systems the cost of shipping up to IISc should be included. IISc will help with customs clearance at Bangalore Airport. Please include your payment option.
Maintenance: 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.
Maintenance: System operation, process and troubleshooting manuals and detailed drawings are a must. Their inclusion must be indicated in the technical bid.
Online support: System should have the capability for online diagnostics from a remote location in case of tool problems.
Post sales service and Indian Presence: 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.
Payment Terms and Conditions: 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.
References: Bidders should provide details of other locations in India with similar tool installations.
References: 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.
Company financials: 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 accountant. Income Tax return for assessment year – 2017-18, 2018-19 and 2019-20.
The following documentation should be provided. ISO9001 quality certification. CE marking confirmation. Must confirm to SEMI standards to be specified in the technical quoted.