UNIVERSITY OF KERALA
DEPARTMENT OF CHEMISTRY

Tender Document

Tender Document for the supply of a Semi-Automatic Screen Printing Machine for ECL screen printed electrodes in the **International Inter University Centre for Sensing and Imaging(IIUCIS)**, Department of Chemistry, University of Kerala, Kariavattom, Thiruvananthapuram-695581

Tenderer Details

Registered Name and Address of Tenderer	
Address for communication	
Other contact information **1. Telephone number Office :** **2. Mobile** **3. E mail** **4. FAX**	
Signature	

FORM OF TENDER

From

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To

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Sir,

I/We hereby tender to supply, under the annexed general conditions of contract, the whole of the articles referred to and described in the attached specification and schedule, or any portion there of, as may be decided by the University of Kerala,Thiruvananthapuram at the rates quoted against each item. The articles will be delivered within the time and at the places specified in the schedule.

*I/We am/are remitting/have separately remitted the required amount of Rs..... as earnest money.

Yours faithfully (Signature)

.....

(Address) .....

Date: .....

*To be scored in cases where no earnest money deposit is furnished.

Important: This tender form may be printed on A4 size paper. Editing of the pre- printed text in the tender form in any way other than as indicated(like ticking, filling in with ink/typing, scoring off inapplicable material etc.) will render the tender form invalid and liable for rejection.

GENERAL CONDITIONS

Sealed tenders are invited for the supply of the materials as specified in schedule attached below.

1. The tenders should be addressed to the Assistant Professor and Head, Department of Chemistry, University of Kerala, Kariavattom campus, Thiruvananthapuram in a sealed cover with the tender number and name–"**Tender for the supply of "Semi-Automatic Screen Printing Machine for ECL screen printed electrodes "** duly superscribed on the cover on or before **03.12.2026 ,3.30 PM**

Tenders which are not in the prescribed form are liable to be rejected and the cost of tender forms once paid will not be refunded.

2. Intending tenderers should send their tenders so as to reach the officer mentioned in the tender notification, on or before the due date and time noted therein. No tender received after the specified date and time will be accepted on any account.The rates will be considered firm for acceptance till the date mentioned therein.Tenders not stipulating period of firmness and tenders with price variation clause and/or'subject to prior sale'condition are liable to be rejected.

a. Every tenderer who has not registered his name with the State Government (Stores Purchase Department), should send along with his tender, an earnest money of Rs. 3500/-. and tender form fee (Rs.826/-)The amount may be paid in the form of Demand Draft (Separate DD for EMD and Tender form Fee) drawn in favour of the Assistant Professor & Head, Department of Chemistry, University of Kerala, Thiruvananthapuram. **Cheques will not be accepted.** The earnest money of unsuccessful tenderers will be returned as soon as possible after the tenders are settled.

b.Tenderers whose names are registered with Government (Stores Purchase Department) are generally exempted from furnishing earnest money for such articles for which they have registered their names. If they tender for stores other than those for which they have registered their names, they will have to furnish earnest money as in the case of unregistered firms. Registered firms will have to quote invariably in every tender they submit,the registration number assigned to them by the Stores Purchase Department. Attested copy of registration certificate may be enclosed with the tender for reference.

c. Small Scale Industries and Cottage Industries within the Kerala state, which are certified as such by the Director of Industries and Commerce or by the Regional Joint Director of Industries and Commerce will be exempted from furnishing earned money against tenders for supply of stores manufactured by them.

3. If any tenderer withdraws from his tender before the expiry of the period fixed for keeping the rates firm for acceptance,the earnest money, if any deposited by him will be forfeited to University of Kerala or such action taken against him as the University think fit.

4. The final acceptance of the tender rests entirely with the University who do not bind themselves to accept the lowest or any tender. But the tenderers should be prepared to carry out such portion of the supplies included in their tender as may be allotted to them.

5. In cases where a successful tenderer,after having made partial supplies, fails to fulfil the contracts in full, all or any of the materials not supplied may at the discretion of the Registrar, be

purchased by means of another tender/quotation or by negotiation or from the next higher tenderer who had offered to supply already and the loss,if any,caused to the University shall hereby,together with such sums as may be fixed by the University towards damages, be recovered from the defaulting tenderer.

6. Payment will be made only after the supplies are actually verified and taken to stock.

7. The tenderer shall undertake to supply materials according to the standard sample and/or specifications

8. No representations for enhancement of rates once accepted will be considered.

9. Any attempt on the part of the tenderers or their agents to influence the University in their favour by personal canvassing with the officers concerned will disqualify the tenderer.

Schedule of Materials

	Item	Quantity	Rate	GST Rate %	GST amount	Total Amount (Total Amount + GST amount)	Remarks
	Semi-Automatic Screen Printing Machine for ECL screen printed electrodes						

Rate quoted should be inclusive of all charges such as packing, forwarding, freight, loading/unloading/handling or installation charges and Government duties leviable, if any.

Other special conditions: Defective items,if any,supplied should be rectified/replaced to the satisfaction of the University by the suppliers at their own cost.

Technical Specification and Compliance Statement

Sl No.	**Parameter and Specification**	**Requirement**	**Compliance (Yes/No)**	**Remarks**
1	Machine type and operation mode	Semi-automatic or automatic flatbed screen printing machine with precision pneumatic vertical lift.		
2	Printing Technology	Flatbed screen printing using mesh screen and photo-emulsion stencil		
3	Machine construction and mechanical rigidity	Heavy-duty body weighing at least 300 kg, designed to minimize mechanical vibration and ensure stable, low-noise operation.		
4	Minimum printing area	At least 200 × 300 mm.		

5	Table X/Y adjustment	Smooth mechanical X/Y adjustment with a minimum travel range of ±10 mm for precise positioning.		
6	Print-head skew adjustment	Adjustable print-head skew angle of at least 5° for alignment correction.		
7	Alignment and registration accuracy	Alignment accuracy should be ±0. 5 mm with rotational accuracy of 1°.		
8	Print-head movement	Pneumatic vertical up-and-down movement to facilitate screen positioning and substrate loading and unloading.		
9	Print bed and substrate fixation	Flat metal honeycomb or equivalent perforated vacuum table with small suction holes to hold substrates securely during printing.		
10	Vacuum pump	Built-in or supplied vacuum pump rated at ≥0.5 HP, suitable for holding thin and porous substrates		
11	Substrate compatibility	Capable of handling ultra thin flexible substrates below 100 µm, including all grades of filter paper, nitrocellulose membranes ,polyester (PET) and polyimide (PI) films, as well as compatible rigid substrates such as ceramics.		
12	Substrate holding	Adjustable vacuum table with low-vacuum control or interchangeable paper-holding fixture		
13	Ink and paste compatibility.	Must support high-viscosity functional pastes and conductive inks, including graphite, carbon black, graphene, gold, silver, Ag/AgCl and insulating/dielectric inks and other compatible flexible substrates		
14	Squeegee and flood coater	Pneumatic squeegee assembly and flood-coating mechanism shall be included.		
15	Range of squeegee	20-250 mm/s		

	speed:			
16	Screen and stencil system	Interchangeable screen frames with adjustable tension and compatibility with fine electrode patterns and multilayer printing.		
17	Minimum printable feature size	Capable of reproducibly printing electrode features and conductive tracks of 0.5 mm or finer, subject to ink, mesh, stencil and substrate characteristics.		
18	Control system	PLC-controlled system with an integrated touchscreen interface for setting and monitoring printing operations.		
19	Power supply	220 V AC, 50 Hz, single phase preferred		
20	Printing repeatability	Consistent deposition and pattern reproduction across repeated prints, demonstrated using suitable conductive ink and substrate.		
21	Electrode pattern compatibility	Suitable for fabrication of working, counter and reference electrodes, conductive tracks, contact pads and insulating patterns.		
22	Accessories	Squeegees, flood coater, screen frames, alignment fixtures, vacuum connections and other essential operating accessories should be supplied.		
23	Substrate thickness	The printer shall be capable of handling ultra-thin flexible substrates below 100 µm with suitable support and fixation arrangements. Adjustable substrate accommodation should cover approximately 0.05 mm to 3 mm thickness. The manufacturer shall specify and confirm the actual minimum and maximum substrate thickness supported.		
24	Screen frames	Interchangeable frames with suitable mesh and stencil compatibility.		
25	Performance Demonstration	1. The supplier shall demonstrate and certify the flawless performance and reliable operation of the equipment in accordance with Installation Qualification (IQ),		

		Operational Qualification (OQ), and Performance Qualification (PQ) requirements. The supplier shall also demonstrate successful printing of a representative screen-printed electrode pattern on Whatman Grade 1 filter paper and a flexible polymer substrate using compatible conductive inks. 2. Supplier shall demonstrate printing of a representative screen-printed electrode pattern on Whatman Grade 1 filter paper and a flexible polymer substrate using compatible conductive ink		
26	Acceptance	Final acceptance of the equipment shall be subject to satisfactory completion of the performance demonstration and verification of compliance with all specified technical and functional requirements by the purchaser.		
27	Provision of Ink Supply	The supplier should provide sufficient quantities of compatible inks for installation, commissioning, performance demonstration, and acceptance testing. The supplier should separately quote the price, packaging size, and technical datasheets for each ink category.		
28	Warranty of the equipment	A comprehensive warranty of minimum of three years from the date of installation should be provided. During the warranty period, there should be two mandatory service visits per year. On-site service with required spares/consumables shall be ensured during the warranty period. Mandatory on-site hands on training should be provided for minimum of 5 days along with lifelong online support whenever service is needed.		
29	Safety	Emergency stop, safety guards and electrical protection		

General Terms and Conditions:

1. Quotes should be inclusive of cost, freight, taxes etc. and should be delivered at the Department of Chemistry, University of Kerala, Kariavattom.
2. Incomplete & conditional quotations and quotations received after the due date will be summarily

rejected without assigning any reasons thereof.

3. The undersigned reserves the right to reject or accept the quotation without assigning any reason.
4. **Installation and Commissioning**: The items shall be installed and commissioned at the International Interuniversity Centre for Sensing and Imaging, Department of Chemistry, University of Kerala, Kariavattom Campus. The supplier should bear all incidental expenses.
5. **Payment:** The University will release the payment only after inspecting the equipment and satisfy that the supply is as per the requirements. The payment will be made after successful completion of the supply and producing invoice in duplicate.
6. **Validity of tender**: Tender submitted shall remain valid at least for 90 days from the date of opening the tender. Validity beyond three months from the date of opening of the tender shall be by mutual consent.
7. The model number, make, and a printed literature of the product shall submit positively.
8. A signed compliance matrix (on specifications and conditions) should be submitted along with the quote.
9. In case of the dispute arises; the decision of University authority shall be final and binding on bidders.
10. General rules relating to the purchase of materials/equipment will also applicable to this quotation.
11. **Tender Notice with duly filled Tender document with sign and seal of the firm in each page should be attached to the tender**

Sd/-

The Coordinator
International Interuniversity Centre for Sensing and Imaging

Department of Chemistry
University of Kerala

No. DC/ST/Eq/10/2026-27 dated 18/11/2026

Sealed tenders are invited from the authorized dealers for the purchase of **Semi-Automatic Screen Printing Machine for ECL screen printed electrodes** in the **International Inter University Centre for Sensing and Imaging(IIUCIS)**, Department of Chemistry, University of Kerala, Kariavattom, Thiruvananthapuram-695581

Last date of submission of Quotation-03/12/2026

Semi-Automatic Screen Printing Machine for ECL screen printed electrodes

The semi-automatic precision screen printing machine is intended for fabricating screen-printed electrodes for electrochemical and electrochemiluminescence (ECL) biosensors. It shall support printing of conductive carbon, graphite, silver, Ag/AgCl and insulating inks on Whatman Grade 1 filter paper, nitrocellulose membranes, PET films and other compatible substrates. The machine shall provide precise pattern alignment, uniform ink deposition and reliable substrate fixation for reproducible fabrication of working electrodes, counter electrodes, reference electrodes, conductive tracks and contact pads ,The machine should

be capable of printing multiple functional layers It shall be suitable for laboratory-scale sensor development and portable diagnostic device fabrication.

Technical Specifications

Semi-Automatic Screen-Printing Machine for Screen-Printed Electrodes (SPEs)

Sl.No	**Technical feature / parameter**	Required specification / requirement
1	Machine type and operation mode	Semi-automatic or automatic flatbed screen printing machine with precision pneumatic vertical lift.
2	Printing Technology	Flatbed screen printing using mesh screen and photo-emulsion stencil
3	Machine construction and mechanical rigidity	Heavy-duty body weighing at least 300 kg, designed to minimize mechanical vibration and ensure stable, low-noise operation.
4	Minimum printing area	At least 200 × 300 mm.
5	Table X/Y adjustment	Smooth mechanical X/Y adjustment with a minimum travel range of ±10 mm for precise positioning.
6	Print-head skew adjustment	Adjustable print-head skew angle of at least 5° for alignment correction.
7	Alignment and registration accuracy	Alignment accuracy should be ±0. 5 mm with rotational accuracy of 1°.
8	Print-head movement	Pneumatic vertical up-and-down movement to facilitate screen positioning and substrate loading and unloading.
9	Print bed and substrate fixation	Flat metal honeycomb or equivalent perforated vacuum table with small suction holes to hold substrates securely during printing.
10	Vacuum pump	Built-in or supplied vacuum pump rated at ≥0.5 HP, suitable for holding thin and porous substrates
11	Substrate compatibility	Capable of handling ultra thin flexible substrates below 100 µm, including all grades of filter paper, nitrocellulose membranes ,polyester (PET) and polyimide (PI) films, as well as compatible rigid substrates such as ceramics.
12	Substrate holding	Adjustable vacuum table with low-vacuum control or

		interchangeable paper-holding fixture
13	Ink and paste compatibility.	Must support high-viscosity functional pastes and conductive inks, including graphite, carbon black, graphene, gold, silver, Ag/AgCl and insulating/dielectric inks and other compatible flexible substrates
14	Squeegee and flood coater	Pneumatic squeegee assembly and flood-coating mechanism shall be included.
15	Range of squeegee speed:	20-250 mm/s
16	Screen and stencil system	Interchangeable screen frames with adjustable tension and compatibility with fine electrode patterns and multilayer printing.
17	Minimum printable feature size	Capable of reproducibly printing electrode features and conductive tracks of 0.5 mm or finer, subject to ink, mesh, stencil and substrate characteristics.
18	Control system	PLC-controlled system with an integrated touchscreen interface for setting and monitoring printing operations.
19	Power supply	220 V AC, 50 Hz, single phase preferred
20	Printing repeatability	Consistent deposition and pattern reproduction across repeated prints, demonstrated using suitable conductive ink and substrate.
21	Electrode pattern compatibility	Suitable for fabrication of working, counter and reference electrodes, conductive tracks, contact pads and insulating patterns.
22	Accessories	Squeegees, flood coater, screen frames, alignment fixtures, vacuum connections and other essential operating accessories should be supplied.
23	Substrate thickness	The printer shall be capable of handling ultra-thin flexible substrates below 100 µm with suitable support and fixation arrangements. Adjustable substrate accommodation should cover approximately 0.05 mm to 3 mm thickness. The manufacturer shall specify and confirm the actual minimum and maximum substrate thickness supported.

24	Screen frames	Interchangeable frames with suitable mesh and stencil compatibility.
25	Performance Demonstration	3. The supplier shall demonstrate and certify the flawless performance and reliable operation of the equipment in accordance with Installation Qualification (IQ), Operational Qualification (OQ), and Performance Qualification (PQ) requirements. The supplier shall also demonstrate successful printing of a representative screen-printed electrode pattern on Whatman Grade 1 filter paper and a flexible polymer substrate using compatible conductive inks. 4. Supplier shall demonstrate printing of a representative screen-printed electrode pattern on Whatman Grade 1 filter paper and a flexible polymer substrate using compatible conductive ink
25.A.	Acceptance	Final acceptance of the equipment shall be subject to satisfactory completion of the performance demonstration and verification of compliance with all specified technical and functional requirements by the purchaser.
25.B	Provision of Ink Supply	The supplier should provide sufficient quantities of compatible inks for installation, commissioning, performance demonstration, and acceptance testing. The supplier should separately quote the price, packaging size, and technical datasheets for each ink category.
26	Warranty of the equipment	A comprehensive warranty of minimum of three years from the date of installation should be provided. During the warranty period, there should be two mandatory service visits per year. On-site service with required spares/consumables shall be ensured during the warranty period. Mandatory on-site hands on training should be provided for minimum of 5 days along with lifelong online support whenever service is needed.
27	Safety	Emergency stop, safety guards and electrical protection

28. Performance

The flawless performance of the equipment has to be demonstrated and certified in accordance with operation qualification, installation qualification and performance qualification.

29. Warranty of the equipment and software:

A comprehensive warranty of minimum of three years from the date of installation should be provided. During the warranty period, there should be two mandatory service visits per year. On-site service with required spares/consumables shall be ensured during the warranty period. Mandatory on-site hands-on training should be provided for minimum of 5 days along with lifelong online support whenever service is needed.

*Sealed tenders should reach **The Coordinator, International Inter University Centre for Sensing and**

Imaging, Department of Chemistry, University of Kerala, Kariavattom, Thiruvananthapuram-695581 on or before 03/12/2026.

The cost of tender form and EMD(Earnest Money Deposit) should be submitted as Demand Draft(DD) issued from a Nationalised & Scheduled Commercial Bank, drawn in favour of the Assistant Professor and Head, Department of Chemistry payable at SBI, Kariavattom Campus(IFSC code SBIN0070043).

Cost of Tender Form	INR 826/-
Earnest Money Deposit	INR 3500/-

The cost of tender form will not be refunded and the separate DD towards the cost of the tender form and the EMD should be submitted. The compliance statement should be submitted that includes all parameters in specification, as detailed in Tender Document.