



GOVERNMENT OF PAKISTAN
PAKISTAN ORDNANCE FACTORIES
TENDER ENQUIRY.

To

M/s _____

Dear Sirs,

Reference: **TENDER ENQUIRY # 0036-FP-B-49-SCM (R&D)-Capt-Pur-III dated; 19.02.2020**

You are requested to submit quotations for the items(s) noted in the Schedule to the Tender as per **PPRA Rule 36(b)** i.e., Single Stage Two Envelope. Offers should be submitted duly sealed in two separate envelopes **by clearly mentioning** T.E No. and due date. Please note the following instructions for filling the tender:-

1. **SUBMISSION OF TENDER**

1.1 Tenders will be **opened at 1200 hours on 30.03.2020 and must reach Bid Center Adjacent to Rabita Hall** on or before **1130 hour upto due date**. The tender received late will not be entertained. You may witness the opening of the tender if you so desire. If a representative is deputed, he should bring a letter of authority from you.

1.2 Only one tender should be included in one envelope. The outside of the envelope should be inscribed with:-

Tender Enquiry #: **0036-FP-B-49-SCM (R&D)-Capt-Pur-III dated 19.02.2020**

Tender to be opened on: **30.03.2020**

Address as follows: **GM – PURCHASE-I, BID CENTER, POF WAH CANTT – PAKISTAN.**

1.3 If envelope does not indicate reference of T.Es or received late the same may be returned un-opened.

2. **GENERAL INSTRUCTIONS REGARDING PREPARATION OF QUOTATIONS & Evaluation Criteria**

2.1 The prices should be filled in column 5 and delivery date in column 6 of the schedule to this Tender Enquiry. The undertaking should be signed at the bottom of the Schedule which shall form the Quotation. You may use a separate sheet if necessary.

2.2 As per **PPRA rule 36 (b)** single stage two envelope procedure will be applied for open competitive bidding. For Plant and Machinery, you are required to quote in **two parts:-**

Part I **"TECHNICAL OFFER"** It should exclusively give technical details and literatures/brochures of the offered plant, machinery and equipment; validity date; delivery schedule; **item wise quantity** and signed undertaking given on the schedule to this Tender Enquiry. It must not indicate price, costs etc.

Part II **"COMMERCIAL OFFER"** It should indicate the commercial terms e.g. price, terms of payment, mode of payment, mode of supply.

Each part should be placed in a separate sealed cover. The envelopes should be inscribed with: Part I "Technical Quotation without price" and Part II "Commercial Quotation with Price."

2.3 The quotation must be extendable if required but must remain valid for, at **least 120 days** from the date of opening of tenders.

2.4 Procurement will be made strictly as per PPRA rules and contract will be placed in favour of lowest evaluated bidder.

2.5 In the event of non-acceptance of offer, intimation may be given to the bidders on their request.

2.6 Conditional offers or alternative offers are likely to be ignored.

2.7 Quotations should be based on F.O.B. The consignment will be shipped through Pakistan National Shipping Corporation (PNSC) In case there is no PNSC service in the country of shipping, please quote on C & F basis. The freight should be indicated separately. Insurance premium should not be included in the quoted price. However where insurance is considered necessary, advice to that effect should be given in the quotation.

- 2.8 Submission of the offer through an agent in Pakistan should be avoided. In case it is considered inevitable, the agent's quotation must invariably be accompanied by the original proforma invoice from the principals/ manufacturers.
- 2.9 Country of origin and port of shipment to be stated.
- 2.10 The offer of principal must clearly indicate whether the rate quoted is inclusive of agent's commission, and if inclusive rate of commission included be specified.
- 2.11 Suppliers will render necessary information regarding hazardous effects on environment, of the materials/products supplied by them, in their quotations and shipping/Dispatch documents.
- 2.12 If the requisite information is not furnished on the T.E form or offer received is not in conformity with the requirement of the T.E or received late/after due date such offer shall be ignored.
- 2.13 Special conditions must be carefully studies and conformed.

3. INSPECTION

- 3.1 Supplies shall be subject to the inspection and acceptance by the **Pre-shipment inspection (PSI) team (03 inspectors)** nominated by the purchaser. All expenses of the PSI team including Air travel from and to Pakistan, boarding lodging and inland travel will be at the supplier's account. **Inspection facilities such as tools, test equipment, instruments etc will be provided by the supplier in accordance with the relevant specification.**
- 3.2 Pre-Shipment Inspection & Training
 - a. Printing of 10x PCBs of various types will be carried out to check accuracy as per specifications of machine.
 - b. Training for **02 weeks for 03 x POF Engineers / Technicians** on operation and maintenance at OEM premises on the equipment.
 - c. **Boarding lodging, travelling and air tickets of trainees will be borne by the supplier/OEM.**
- 3.3 Installation and Commissioning
 - a. Installation & commissioning of the machines at POF Wah Cantt shall be the responsibility of the machine supplier. Machines will be tried out for capacity run for at least 10PCBs of different type in purchaser's premises.
 - b. The supplier will provide **02 years warranty/guarantee certificate**, which will be **valid for a period of 24 months** after successful installation and commissioning of the machine.
- 3.4 Where considered necessary by the Purchaser, stores may be obtained on Warranty/Guarantee, subject to inspection on receipt. Rejected stores will be removed and replaced with the acceptable stores by the Supplier at his own expense, within a specified time.
- 3.5 TENDER SAMPLE. Where required offer must accompany tender sample strictly according to the description given in tender Enquiry. Offer not accompanied by tender sample will NOT be entertained excepting the established and reputable firms who have either previously satisfactorily supplied the same or similar stores or have submitted an acceptable samples thereof against previous T.E.

4. ACCETANCE OF OFFERS

- 4.1.1 The procuring agency may reject all bids or proposals at any time prior to the acceptance of a bid or proposal. The procuring agency shall upon request communicate to any supplier or contractor who submitted a bid or proposal, the grounds for its rejection of all bids or proposals, but is not required to justify those grounds.
- 4.1.2 Procuring agency shall incur no liability, solely by virtue of its invoking sub-rule (1.1) towards suppliers or contractors who have submitted bids or proposals.
- 4.1.3 Notice of the rejection of all bids or proposals shall be given promptly to all suppliers or contractors that submitted bids or proposals.

4.2 **PERFORMANCE BOND**

- (a) The successful bidders will provide Performance Bond at the rate upto **10% of F.O.B.** value of contract in favour of the Controller Military Accounts (CMA) POF Wah Cantt. The Performance Bond will be furnished in the form of Deposit At Call Receipt (CDR) from any scheduled Bank in Pakistan or an unconditional bank guarantee on prescribed proforma covered by any scheduled bank in Pakistan. The **Performance Bond shall be furnished within 45 days** from the date of opening of Letter of Credit. It shall be valid for a period of 12 months after the date of expiry of letter of credit. If the Performance Bond is not furnished within the prescribed time of 45 days, the Purchaser reserves the right to:
- i. Impose penalty @ 1 % per month of the value of CDR/BG.
(Clause-4.2 (a i) is not applicable in case of procurement of Plant / Equipment / Machinery items)
OR
 - ii. Cancel the contract and make other arrangements for purchase of the stores at the risk and expense of the Supplier.
- (b) No Performance Bond will be required if the total FOB value of the contract is **less than US\$ 50,000** and contract is placed directly on the foreign Supplier.

4.3 **FAILURE TO SUPPLY THE STORES**

All deliveries must be completed by the specified date. If the failure to deliver the stores within the scheduled time should have arisen from "Force Majeure", which the Purchaser may admit as reasonable ground for further time, he will allow such additional time as he may consider to have been required by the circumstances of the case. Otherwise, he will be entitled, at his discretion, to cancel the contract; and/or, claim liquidated damages upto 2% but not less than **1%** of the contract price of the items and their quantities for each and every month or part of a month, beyond the specified delivery date, during which these may not be delivered, subject to a maximum of **10%** of the total contract value of particular store which remained unsupplied either in part or in full or, to purchase, from elsewhere, the unsupplied stores at the risk and cost of the Supplier.

4.4 **PAYMENT**

100% Payment will normally be made by means of an irrevocable letter of credit. Unless otherwise stated **80%** payment will be released on submission of Dispatch documents (including acceptance certificate issued by PSI team duly signed by the firm) to Bank while balance **20%** payment will be released on receipt, installation / commissioning, successful trial and final acceptance of store/machine by the competent authority i.e. Director R&D.

All Bank charges incurred in Pakistan in connection with the establishment of L.C. will be borne by the Purchaser, whereas all Bank charges incurred in connection with drawing of payment including charges for confirmation of L.C. by the advising Bank/Foreign Bank will be borne by the Supplier.

5 **SECURITY OF INFORMATION**

The tendered and his employees must not communicate any information relating to the sale/purchase of stores under this enquiry to any person other than the manufacturer or to any press or agent not authorized in writing by POFs to receive it.

Please return the Schedule to the Tender duly signed by the specified date, along with the specifications drawings etc. if any, enclosed herewith - even if you are unable to quote.

6 **WARNING**

In case the firm abstain from making offers or fail to return/acknowledge the tender form by the specified date on three consecutive occasions, no further tender enquiry may be issued to them and their names would liable to be removed from the approved list.

Note: Offers/bids through E-Mails & Fax are not acceptable. Only one competitive offer/bid must be submitted on firm's original letter head pad through Mail/Courier.

Yours faithfully,

Contact Info:

☎ 051-9055-22269,21087,21088
Fax: 051-9271400, 051-9314100
Email: procurement@pof.gov.pk

(SYED QAISER MEHMOOD)
DIRECTOR SUPPLY CHAIN MANAGEMENT
PAKISTAN ORDNANCE FACTORIES
WAH CANTT, PAKISTAN

PAKISTAN ORDNANCE FACTORIES**SCHEDULE TO TENDER NO. 0036-FP-B-49-SCM (R&D)-Capt-Pur-III dated 19.02.2020****(1) FOR Plant & Machinery:-**

| (1) | (2) | (3) | (4) | (5) | | (6) |
|------------------------|--|--------------------|-------------------|--|------------------------|---|
| <u>Item No.</u> | <u>Description with Specs. etc.</u> | <u>Unit</u> | <u>Qty</u> | <u>Price per Unit</u> <u>FOB or C & F</u> | | <u>Delivery Date/ Period</u> |
| | | | | <u>In Figures</u> | <u>In Words</u> | |
| 1. | Printed Circuit Board Fabrication & Assembly System Specification and quantity of each item is enclosed As per Annexure "A" | System | 01 | | | 03 Months or earlier after opening of LC |

Note: Price to be quoted at Col 5 should be total FOB or C&F and its breakdown must also be endorsed on original letter head against each item as per spec and quantity mentioned vide Annexure "A"

(2) Special Conditions

- i. Commercial offers will be opened of those bidders who will qualify in technical evaluation.
- ii. Contract will be placed in favour of lowest evaluated bidder in the light of PPRA rules as per POF Contract format POF-1282 and other terms and conditions mutually agreed between POF and the contractor / firm.
- iii. The supplier will submit an undertaking to ensure availability / supply of spares for machine upto a period of 10 years.
- iv. Obtaining of Export permit from the concerned Govt. will be the responsibility of the firm / bidder. Non issuance of Export permit from the country of origin shall not constitute "**Force Majeure**"
- v. Installation / commissioning, successful trail and local onsite training (to POF personnel) will be arranged by the supplier.
- vi. **Local rep in Pakistan for after Sales Service may also be nominated.**
- vii. Change of Beneficiary / Title of contract will not be allowed after T.E opening.
- viii. Firms submitting their offers if FOB basis then mentioned port of shipment. In case of C&F based freight charges separately.
- ix. Accessories, Spare Parts, and Optional Items should be quoted indicating their rates separately.
- x. Quotations should be based on for local supplier:-
F.O.R. station of Dispatch basis, i.e. delivered free on rail, inclusive of packing and forwarding charges. The stores will be booked under Military Credit Note, to be provided by the purchaser.
and / or Free delivery at Central Stores POF Wah Cantt. In this case Octori duty will be payable by the supplier.
- xi. Taxes and Duties etc. where applicable, must be shown separately, quoting reference to Registration No. in cases of Sales Tax and relevant authority in the case of others. Offer without these clarifications and inclusive of Taxes and Duties may be ignored.
- xii. Taxes and duties levied on or after Tender opening date or on or after the date offer was signed and dispatched will be allowed to include in the offered rates provided that special condition xi (above) has been conformed properly.
- xiii. "Suppliers will furnish a certificate, issued by Excise & Taxation Deptt, that he has cleared all Professional Tax payable by him" offers received without this certificate will be rejected.
- xiv. Suppliers will render necessary information regarding hazardous effects on environment, of the materials/products supplied by them and Material Safety Data Sheet (MSDS), in their quotations and shipping/dispatch documents.
- xv. **TENDER FEE.** The tender must be accompanied by a non-refundable fee by means of a crossed postal order/pay order for Rs 500/- in favour of Director Admin POFs Wah Cantt.

xvi. **BID Security.**

- a. Bid Security at the rate of 2% (for firms registered with POF) and 5% (for un-registered firms) of the quoted value should accompany the tender in the shape of Call Deposit Receipt/Pay Order/Banker’s Cheque, from a scheduled Bank drawn in favour of:-
 “General Manager-Purchase-I, POF Wah Cantt.” Tenders received without/less Bid security will be rejected.
 - b. Bid security of the unsuccessful tenderers will be returned as soon as the scrutiny of the tenders is completed. Bid Money of the successful tenderers will be retained until the contract is finalized. Bid Money will be forfeited in case the quotation is withdrawn before the expiry of its validity date.
 - c. State owned organizations are not required to provide Bid Money.
- xvii. Local supplier payment will be made by the C.M.A (POF) through crossed cheque on receipt/acceptance of stores on our prescribed bill form supported by receipt voucher on part/full supply basis.
- xviii. Local supplier payment of duties /Taxes including professional tax (where applicable) must be supported by proof of having paid these to concerned Govt. Taxation Deptt.
- xix. **POF QHSE Policy is given as under: POF Board is committed to produce quality products and promote Health, Safety & Environment performance at their workplaces in compliance with all applicable National level legal and other requirements of QHSE standards ISO 9001: 2015, ISO 14001:2015, ISO 45001: 2018) to satisfy all stakeholders by continual improvement of QHSE management system with emphasis on the following: -**
- a. **Induction of process and quality improvement tools for production of consistent quality products leading to customer satisfaction.**
 - b. **Application of Engg. Solution for prevention of pollution & Disposal of wastes to minimize adverse impacts to the environment & community and sustained efforts for conservation of natural resources.**
 - c. **Minimization of risks for ensuring health and safety of employees, contractors, visitors & installation.**
 - d. **Creation of competence through training to enhance QHSE system effectiveness.**

(3) **Undertaking:-**

Should our offer be accepted, we hereby undertake to supply the stores/render the services contracted on the basis of General Conditions of Contract embodied in Form POF 1282, and to deposit the performance bond within the prescribed time, failing which it will constitute a breach of contract, and POF will have the right to purchase the stores/services elsewhere at our risk and cost.

Place _____
 Date _____
 Name _____
 Position _____
 Address _____
 Income Tax G.I.R.No. _____

Signatures of Tenderer

PRINTED CIRCUIT BOARD FABRICATION & ASSEMBLY SYSTEM

| | | |
|--|----------------------------------|--|
| 1. <u>Technical Specifications</u> | | |
| 1.1 <u>CNC-Drilling and Contour Router – Qty 01</u> | | |
| a. | Range of RPM | 3000 – 63,000 |
| b. | Traveling speed | 1 – 9000 mm/min |
| c. | Software resolution | 0.01µm |
| d. | Mechanical resolution | Step resolution (software selectable): 1 mil, ½ mil, ¼ mil, 3.175 µm |
| e. | Tool diameter | 0.1mm – 3.175mm |
| f. | Position accuracy | 20 ppm (0.002%) over the entire work space |
| g. | Maximum position speed per axis | 150 mm/s |
| h. | Maximum working speed per axis | 150 mm/s |
| i. | Drill speed | 300 holes/min |
| j. | Automatic Tool change | 16 |
| 1.2 <u>Deburring Machine – Qty 01</u> | | |
| a. | Working width | 400 mm |
| b. | Board thickness | 0.3-5.0 mm |
| c. | Board size min-max | 80x120 mm – 400x 300mm |
| d. | Brushing speed | 1360 rpm |
| e. | Conveyor speed | 0.2 – 2.0 m/min |
| f. | Oscillation stroke | 10 mm |
| g. | Oscillation frequency | 10 – 110/min |
| h. | Brushing stroke on upper roller | Max. 20 mm |
| i. | Brushing stroke on lower roller | Max. 15 mm |
| j. | Feed per turn of hand wheel | 0.266 mm |
| k. | Brushing roller length | 410 mm |
| l. | Brushing roller outside diameter | 89 – 91 mm |
| m. | Rinsing system pressure max | 1.5 bar |
| 1.3 <u>Galvanic Plating – Qty 01</u> | | |
| a. | Treatment tank dimensions | 500 x 100 x 450 mm |
| b. | Treatment tank capacity | 20 ltr |
| c. | Galvanic tank dimensions | 500 x 300 x 450 mm |
| d. | Galvanic tank capacity | 60 ltr |
| 1.4 <u>Dry Film Laminator – Qty 01</u> | | |
| a. | Lamination width max | 400 mm |
| b. | Transport width max | 440 mm |
| c. | Board thickness | 0.3 – 5.0 mm |
| d. | Board size | Min 50 x 50 mm; Max. 450 mm x 300mm |
| e. | Lamination speed | 0.2 – 1.2 m/min adjustable |
| f. | Resist tension | Adjustable |
| g. | Lamination pressure | Adjustable |
| h. | Temperature range | 20 – 120 °C |
| 1.5 <u>Vacuum Exposure – Qty 01</u> | | |
| a. | Max. working area | 600 x 600 mm |
| b. | UV- Light emission | Controller based |
| c. | Yellow light table | Built-in |

| 1.6 <u>Developing, Etching and Stripping Machines – Qty 02</u> | | |
|---|---|---|
| a. | Working width | 510 mm |
| b. | Stepless adjustable conveyor speed | 0 – 1.5 m/min |
| c. | Etchant pump | 200 l/min |
| d. | Line definition | 35 µm |
| e. | Spaces on copper | 18 µm |
| f. | Tank capacity | 55 ltr |
| 1.7 <u>Multilayer Press – Qty 01</u> | | |
| a. | Board size | 350 x 450 mm |
| b. | Pressure | 24 t |
| c. | Temperature | Up to 250°C |
| d. | Heating up | Approx. 30 min |
| e. | Pressing time | Approx. 60 min |
| f. | Cooling down | Approx. 120 min |
| 1.8 <u>Solder Paste Printer – Qty 01</u> | | |
| a. | Print size | min. 80 x 50 mm, max. 680 x 500 mm |
| b. | Stencil size | 737 x 737 mm |
| c. | PCB thickness | max 6 mm |
| d. | Print speed | 10 - 180 mm/s |
| e. | Print pressure | 0 - 200 N |
| f. | Cycle time | 10 s + print |
| g. | Setup time | < 10 min |
| h. | Product change | < 2 min |
| 1.9 <u>Pick and Place – Qty 01</u> | | |
| a. | Optimum placement speed Chip | 18,300 cph |
| b. | Dispensing speed | 145,000 dot/h |
| c. | Job changeover time | < 1 min |
| d. | Feeder capacity (8mm tape) | No. 280 |
| e. | Component size range | 0201 33 x 33 mm incl. leads 0201 80 x 33 mm incl. leads Up to 80 x 80 mm incl. leads 01005 (0.4 x 0.2mm) |
| f. | Min. lead pitch | 0.3 mm (12 mil) |
| g. | Min. ball diameter / pitch | 0.2 mm |
| h. | Min. component height | > 0.0 mm |
| i. | Max. component height | 18 mm |
| j. | Linear encoder resolution (x,y) | 0.2 µm |
| k. | Rotation axis resolution | 0.007° |
| l. | Overall placement accuracy XY Chips | ± 50 µm |
| m. | Overall placement accuracy XY QFP 64/100 | ± 45 µm |
| n. | Min. PCB dimensions | 20 x 20 mm |
| o. | Max. PCB dimensions | 560 x 610 mm |
| p. | PCB thickness | 0.5 - 3.5 mm |
| q. | PCB edge clearance | 3.0 - 5.0 mm |
| r. | Clearance below PCB | 40 mm |
| 1.10 <u>Reflow Oven – Qty 01</u> | | |
| a. | Heating zone | 4 |
| b. | Cooling zone | 1 |
| c. | Max reflow width | 400 mm |
| d. | Max substrate width | 60 – 400 mm |

| | | |
|----|---------------------------------|--|
| e. | Conveyor speed range | 100 – 800 mm/min |
| f. | Conveyor speed repeatability | ± 2 mm |
| g. | In feed length | 300 mm |
| h. | Out feed length | 200 mm |
| i. | Entrance height | 30 mm |
| j. | Free space below substrate | 20 mm |
| k. | Max temperature | 290°C |
| l. | ΔT within 400 mm conveyor width | <4°C |
| m. | Ramp times | 1.8-2°K/sec (Preheating zones), 2-3°K/sec (Reflow zone), 2.5-3°K/sec (Cooling zone) |

1.11 Automatic Optical Inspection Machine – Qty 01

| | | |
|----|------------------------|--------------------|
| a. | Inspection | 2D, 3D, 4D |
| b. | Camera | 12 MP |
| c. | Angular Camera | 4-Directional |
| d. | Single lane board size | 750 x 560 mm |
| e. | Double lane board size | 2 x (750 x 280 mm) |
| f. | Resolution | 7 μm |

1.12 BGA Rework Station – Qty 01

| | | |
|----|-----------------------|---------------------------------------|
| a. | Upper heating | Hybrid emitter (800 W), 60 x 60 mm |
| b. | Lower heating | IR emitter (25 x 600 W), 625 x 625 mm |
| c. | PCB size | 20 x 20 - 625 x 625 mm |
| d. | PCB thickness | up to 10 mm |
| e. | Component size | 0.5 x 0.5 - 60 x 60 mm |
| f. | Reflow process camera | 5 MP GigE color camera |
| g. | Focal width | 25 mm |
| h. | Lighting | 2x LED light source |

Note:

- Technical offer must include detailed tests for geometrical accuracy of machines according to international standards.

2. Line Accessories' Technical Specifications

2.1 Board Cutter – Qty 01

| | | |
|----|---------------------------------|--------|
| a. | Cutting width | 530 mm |
| b. | Adjustable back stop | 300 mm |
| c. | PCB cutting sheet thickness | 0-3 mm |
| d. | Plastic cutting sheet thickness | 0-5 mm |

2.2 Photo Plotter – Qty 01

| | | |
|----|----------------------------|---|
| a. | Max film size | 380 x 460 mm ² |
| b. | Max plot format | 360 x 430 mm ² |
| c. | Speed | 7 mm of film width/min at 2032 dpi or above |
| d. | Resolution X | 1625, 2032, 3251, 4064, 6502, 8128, 16256 dpi |
| e. | Resolution Y | 25400 dpi |
| f. | Fine point/line | 5 μm |
| g. | Fine space between 2 lines | 10 μm |
| h. | Fine space between 2 areas | 18 μm |
| i. | Fine inverse spot dia | 25 μm |

2.3 Reference Pin Punching Equipment – Qty 01

| | | |
|----|-------------------------|-----------------------|
| a. | Board size | 400 mm |
| b. | Depth limiter | Adjustable |
| c. | Required drill diameter | 0,60,81,01,51,72,0 mm |

| | | |
|---|--|--|
| 2.4 <u>PCB Hot Air Dryer – Qty 01</u> | | |
| a. | Working width | 300 mm |
| b. | Printed circuit thickness | 0.2 - 4 mm |
| c. | Minimum printed circuit length | 80 mm |
| d. | Transport speed | 0.2 - 1.2 m / min |
| 2.5 <u>PCB Loader – Qty 01</u> | | |
| a. | Number of racks | 3 |
| b. | Magazine size | 460 x 400 x 570 mm |
| c. | PCB size | 70-440 x 70-330 mm |
| d. | Board feeding pitches | 1~4 steps (10, 20, 30, 40 mm) |
| e. | PCB loading time | ±6 sec |
| 2.6 <u>PCB Unloader – Qty 01</u> | | |
| a. | Number of racks | 3 |
| b. | Magazine size | 460 x 400 x 570 mm |
| c. | PCB size | 70-440 x 70-330 mm |
| d. | Board feeding pitches | 1~4 steps (10, 20, 30, 40 mm) |
| e. | PCB Unloading time | ±6 sec |
| 2.7 <u>Buffer/Inspection Conveyor – Qty 01</u> | | |
| a. | Conveyor speed | 0.5 – 20m/min |
| b. | PCB edge support | 3 mm |
| c. | PCB size | Min. 50x50x0.6 mm; Max. 457x460x4.5mm |
| d. | Inspection Light | Bright |
| Note: | | |
| <ul style="list-style-type: none"> ▪ Any other part or pre-requisite assembly required to run above two lines (PCB Fabrication & Assembly Line) can be included in the technical offer. ▪ Technical offer must include detailed tests for geometrical accuracy of machines according to international standards. | | |
| 3. <u>Technical Requirements</u> | | |
| 3.1 <u>CNC-Drilling and Contour Router</u> | | |
| a. | Vacuum Board fixation | Required |
| b. | Automatic tool change | Required |
| c. | Integrated control unit | Required |
| d. | English display language | Required |
| 3.2 <u>Deburring Machine</u> | | |
| a. | Double side operation | Required |
| b. | Upper and lower brushing rollers with adjustable pressure and digital read-out | Required |
| c. | Variable oscillation and transport speed | Required |
| d. | Close loop rinsing system | Required |
| e. | Compliance with German and European waste water pollution directives | Required |
| 3.3 <u>Galvanic Plating</u> | | |
| a. | PTFE/PFA coated heaters | Required |
| b. | Digital timers for each bath | Required |
| c. | Board movement by DC gear motor with adjustable speed | Required |
| 3.4 <u>Dry Film Laminator</u> | | |
| a. | Detachable inlet table | Required |
| b. | Adjustable laminating speed | Required |
| c. | Electrically heated lamination rollers with uniform temperature distribution | Required |
| d. | Separate transport rollers for non-creasing laminate transport | Required |
| e. | Digital setting and read out of lamination temperature | Required |
| f. | Adjustable lamination pressure | Required |

| 3.5 Vacuum Exposure | | |
|---|--|----------|
| a. | Cooling fans | Required |
| b. | Vacuum assisted drawer | Required |
| c. | Control panel for automatic operations | Required |
| 3.6 Developing, Etching and Stripping Machines | | |
| a. | Joint free belt drive | Required |
| b. | PCB securing by upper and lower transport rollers | Required |
| c. | Double sided etching process with integrated rinsing zone | Required |
| d. | Machine modification according to our needs for switching between developing, etching and stripping | Required |
| e. | Drying by squeezing rollers | Required |
| f. | Adjustable spray pressure | Required |
| g. | Thermostat with digital read out and self-safe overheat cut-off | Required |
| h. | Suitable for all regular etching agents | Required |
| 3.7 Multilayer Press | | |
| a. | Even pressure distribution over the surface | Required |
| b. | Layer registration software | Required |
| c. | Digital and adjustable thermostats | Required |
| d. | Digital timer | Required |
| e. | Pressure valve with pressure meter | Required |
| f. | Two automatic air ventilators during cooling cycle | Required |
| g. | Loading door protected with security switch | Required |
| h. | Compact and robust body structure | Required |
| i. | User friendly control panel | Required |
| 3.8 Solder Paste Printer | | |
| a. | Area camera for Substrate alignment and optional Inspection | Required |
| b. | Easy program set up by scanning 100% of the PCB | Required |
| c. | Recognition of synthetic Fiducials or any structure on PCB and Stencil | Required |
| d. | Diffuse und direct light source for best optical recognition and alignment of the PCB | Required |
| e. | Two independent pneumatic print heads, self-level design | Required |
| f. | Programmable print head with closed loop control | Required |
| g. | Pneumatic squeegee clamping prevents losing during production | Required |
| h. | Over top substrate clamping and side clamping, bended board safe clamping | Required |
| i. | Motorized track width adjustment, standard: front rail fixed | Required |
| j. | Transport direction: Standard: left-right, left-left. Option: right-left, right-right | Required |
| k. | Magnetic pins and blocks for PCB support | Required |
| l. | Windows 10, 22" Touch monitor, machine files and SPC data are supported by the local network | Required |
| m. | Remote diagnostic | Required |
| n. | Stencil wiper with motorized paper feed along with controlled speed | Required |
| o. | Configuration of dry, wet and vacuum cleaning modus | Required |
| p. | Cleaning solvent dispensed on a gravity-based principle to guaranty a constant amount with adjustable speed and flow | Required |
| q. | Vacuum plenum | Required |
| r. | Maintenance kit | Required |
| 3.9 Pick and Place | | |
| a. | CLM & hyQFeeder system | Required |
| b. | Interior lighting LED | Required |
| c. | Dual Bottom Camera System | Required |

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| d. | 4x spindles Pick & Place head and optional 1x Dispensing axis | Required |
| e. | SMEMA interface | Required |
| f. | Inline systems: Conveyor direction L/R, R/L, batch mode R/R, L/L | Required |
| g. | ePlace P&P/Disp. software (English) | Required |
| h. | Machine PC with Windows 10 OS and touch screen | Required |
| i. | Technical support software | Required |
| j. | Standard User Level Management (software) | Required |
| k. | Bad mark sensing with vision (software) | Required |
| l. | Universal CAD conversion (software) | Required |
| m. | Automatic Placement constraints (software) | Required |
| n. | Basic calibration set P&P | Required |
| o. | Maintenance kit | Required |
| 3.10 Reflow Oven | | |
| a. | PCB handling with Mesh belt conveyor | Required |
| b. | Display language: English | Required |
| c. | Temperature units: °C, °F | Required |
| d. | Board counter | Required |
| e. | Transport direction: left to right | Required |
| f. | SMEMA Interface | Required |
| g. | Noise level 70 dB (A) maximum | Required |
| h. | Emergency stop buttons 2 (on left and right side of the machine) | Required |
| i. | Main power disconnect or 1 with under voltage circuit breaker | Required |
| j. | Overheat temperature control for each zone (permanent breaker) | Required |
| k. | Safety standards: CE, EN 954-1 Class 3 | Required |
| l. | Temperature display Directly on the on the integrated LCD Panel | Required |
| m. | Recording time up to 180 hours | Required |
| n. | Data export format .pdf, .csv | Required |
| o. | PC with Windows 10 OS + Proprietary software for recording, comparing, storage and documentation of temperature profiles and zone temperatures. Up to 50 hours recording time per profile. CSV data export possible. | Required |
| p. | Offline Feeder Setup station, complete - Incl. <ul style="list-style-type: none"> - PC - Feeder adapter, - Power supply - Barcode scanner - Label printer - Software | Required |
| q. | Side license for Offline CAD Converter for the installation on another PC having identical functionality | Required |
| 3.11 Automatic Optical Inspection Machine | | |
| a. | Parallel processing in dual lane | Required |
| b. | Optimal inspection Techniques: <ul style="list-style-type: none"> • Brightness • Infrared • Color • Shape • laser | Required |
| c. | Mobile Terminal Pass/ Fail Function | Required |
| d. | Defect component identification | Required |
| e. | Creation of inspection programs | Required |
| f. | Inspection history management system | Required |

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| g. | Capable to be interfaced with production line | Required |
| h. | On board user friendly latest operating system | Required |
| i. | Display language (English) | Required |
| 3.12 BGA Rework Station | | |
| a. | Control Unit with Microsoft™ Windows 10 operating systems | Required |
| b. | Antistatic Design | Required |
| c. | Display Language (English) | Required |
| d. | Automatic and precise component alignment with the help of machine vision | Required |
| e. | Highly accurate, motor-driven axis system for component placement (± 0.025 mm) | Required |
| f. | User independent, reproducible repair results | Required |
| Note: Technical offer must include detailed tests for geometrical accuracy of machines according to international standards. | | |
| 4. Line Accessories' Technical Requirements | | |
| 4.1 Board Cutter | | |
| a. | Transparent cover hood for user safety and visual control | Required |
| b. | Adjustable cutting angle | Required |
| c. | Adjustable clearance | Required |
| d. | Built-in clamping unit | Required |
| 4.2 Photo Plotter | | |
| a. | System capable to process Gerber and bitmap files | Required |
| b. | Precise edge definition in photo quality | Required |
| c. | Perfect blackness results in perfect opacity | Required |
| d. | Standalone unit | Required |
| e. | Data transmission by USB stick or via USB cable | Required |
| f. | Touch-Display and intuitive user interface | Required |
| g. | 3 different plot speeds for either high precision or less time consumption | Required |
| h. | Higher resolutions in Gerber2bitmap | Required |
| 4.3 Reference Pin Punching Equipment | | |
| a. | Manual mode of operation | Required |
| b. | Robust fixture | Required |
| 4.4 PCB Hot Air Dryer | | |
| a. | Control panel for parameter adjustment | Required |
| b. | Continuous drying | Required |
| c. | Variable conveyor speed | Required |
| d. | Suitable for different thicknesses of printed circuit board | Required |
| e. | Low surface temperature | Required |
| 4.5 PCB Loader | | |
| a. | Self-diagnosis function | Required |
| b. | Automatic magazine loading | Required |
| c. | Touch control panel | Required |
| d. | Automatic conveyor width adjustment | Required |
| e. | Left to right conveyor direction | Required |
| f. | Cooling fan integrated in pusher conveyor section | Required |
| 4.6 PCB Unloader | | |
| a. | Self-diagnosis function | Required |
| b. | Automatic magazine loading | Required |
| c. | Touch control panel | Required |
| d. | Automatic conveyor width adjustment | Required |
| e. | Left to right conveyor direction | Required |

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| f. | Compact and elegant design | Required |
| g. | Cooling fan integrated in pusher conveyor section | Required |
| 4.7 <u>Buffer/Inspection Conveyor</u> | | |
| a. | Touch control panel for adjusting conveyor speed and light | Required |
| b. | Modes of operation: Auto, Pass, Manual | Required |
| c. | Convenient and easy-to-use operating system | Required |
| d. | Conveyor direction: Left- right or both | Required |
| Note: | | |
| <ul style="list-style-type: none"> ▪ Any other part or pre-requisite assembly required to run above two lines (PCB Fabrication & Assembly Line) can be included in the technical offer. ▪ Technical offer must include detailed tests for geometrical accuracy of machines according to international standards. | | |
| 5. <u>Spare Parts, Calibration Equipment & Accessories</u> | | <u>QYT</u> |
| a. | Calibration equipment (as deemed appropriate for respective work units) | 01 (for each) |
| b. | Tool Kits | 01 (for each) |
| c. | Electroplating Kit (Starter Kit) | 04 |
| d. | Consumable Tinning SUR-TIN (Sets) | 10 |
| e. | Dry Film Solder Resist, Rolls 305mm x 25 meters | 04 |
| f. | Dry Film Etch Resist (Photoresist), Rolls 304mm x 152M | 04 |
| g. | Film Sheets for Photoplotter 50/Box. | 12 |
| h. | Developer (Liter) | 10 |
| i. | Fixer (Liter) | 10 |
| j. | Dark Room Safe Light Green (Special) | 02 |
| k. | Triple Tank for Film Star (PVC) | 01 |
| l. | Copper Clad Laminates, Mix of FR4 with SS DS and MLB | 01 |
| m. | Chemicals Misc. enough for 1000 Sqft Processing | 01 |
| n. | Set of Drill bits, Routers, Isolation tools, 300 + 50 + 10 | 01 |
| o. | Backing boards and Aluminum Entry Foils enough for 1000 Sqft Processing | 01 |
| p. | Anodes 150 x 200 mm | 08 |
| q. | Anode Bags, 150 x 200 | 08 |
| r. | Flexible stencil mount | 01 |
| s. | Cleaning Paper Rolls for Solder Printer | 50 |
| t. | Calibration Tool Set for automatic XY axis mapping for Pick and Place Machine | 01 |
| u. | Feeder rack (Master) for up to 15 hyQ feeders (max.30x8mm) and control of additional feeder racks (slaves) | 02 |
| v. | Feeder rack (slave) for up to 15 hyQ tape feeders (max.30x8mm) | 02 |
| w. | Feeder Rack-Extension hyQ with 5 slots or up to 10 lanes compatible with offered Pick and Place | 04 |
| x. | Complete set of all type of feeders with different component size handling capability required with offered Pick and Place | 01 |
| y. | 435 Liter (RH 1-10%) TR-FCDE435(A) DRY Cabinet | 01 |
| z. | MP900 Solder Paste Mixer or having better specs | 01 |
| aa. | Reflow Oven Profiler with 6 Channels | 01 |
| bb. | E806 ESD PCB Magazines 125 degrees C or any other having similar specs | 50 |
| cc. | Thermocouple set (2 pieces) for online temperature measurement on the PCB, temperature display directly on the integrated LCD | 01 |
| dd. | Oiling system for chain conveyor of Reflow Oven | 01 |
| ee. | Exhaust including ventilation for Oven | 01 |
| ff. | Solder Paste Mixer (SMP900) or equivalent | 01 |
| gg. | Reflow oven Profiler (with 6 channels) | 01 |
| hh. | 435 Liter (RH-1-10%) TR-FCDE435 (A) DRY Cabinet or equivalent | 01 |
| ii. | E806 ESD PCB Magazines 125°C (Max. PCB Size 445x330mm) or equivalent | 50 |
| Note: Availability of all other electrical, electronic and mechanical spares on payment basis for at least 10x years (as and when required basis). | | |

| <u>Tech documents and software's</u> | |
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| a. | Complete set of technical documents, inspection procedure, troubleshooting manual in English |
| b. | Free of cost software up gradation for next 10 x years of each machine |
| c. | 10 x years spares supply support of each machine from OEM |
| d. | Details of motors, sensors (make, model & specs) and their control. |
| e. | Operating, maintenance, service manual (Hard & Soft form) and CDs / DVDs related software / drivers in English language. |
| f. | Working drawing of cutting tool and equipment. |
| <u>Specification for Electrical Equipment</u> | |
| a. | Site Environmental Conditions. The ambient temperature variation between winter and summer is from -5°C to 50°C, the relative humidity varies between 15% to 80%. The high humidity period does not exceed 2 months in the year. |
| b. | Specification. The acceptable specifications will be those of being governed by IEC recommendations. |
| c. | Insulation: The requirement is class B insulation. |
| d. | <u>Available utilities</u> Following are available upto battery limits of proposed site for installation of machine: <u>Power supply system</u> 1) Electrical: 400 ± 5% VAC, 50 Hz, 3 Phase, 4-Wire System 220 ± 5% VAC, 50 Hz, 1 Phase 2) The equipment should be earthed. 3) Available earthing resistance less than 1 ohm. 4) All motors should be IP 64 protected. 5) All electrical and electronic equipment should have line protection circuit breakers with thermally delayed overload release and electro-magnetic quick-acting release, as required. It should be followed by cut-out and safety fuzes to provide optimum selectivity, if necessary. 6) Face sequence relay should be integrated. 7) The industrial electrical measuring instruments, wherever used should have an accuracy of class 0.5 or better at control panel. <u>Available Air Supply:</u> 04 - 06 bars. |
| NOTE: - ISO/DIN or equivalent specification is acceptable for electrical equipment. | |
| <u>6. Pre-Shipment Inspection and Training</u> | |
| a. | Printing of 10x PCBs of various types will be carried out to check accuracy as per specifications of machine, by PSI team. |
| b. | Training for 02 weeks for 02 x POF Engineers / Technicians on operation and maintenance at OEM premises on the equipment. |
| c. | Boarding lodging, travelling and air tickets of POF 03 x offers for PSI team and 02 x POF Engineers / Technicians will be borne by the supplier/OEM. |
| <u>7. Installation and Commissioning</u> | |
| a. | Installation & commissioning of the machines at POF Wah Cantt shall be the responsibility of the machine supplier. Machines will be tried out for capacity run for at least 10PCBs of different type in purchaser's premises. |
| b. | The supplier will provide 02 years warranty/guarantee certificate, which will be valid for a period of 24 months after successful installation and commissioning of the machine. |
| <u>8. Country of Origin</u> | |
| a. | Europe, UK, USA and Japan. |
| <u>9. Payment Terms and Conditions</u> | |
| a. | 80% payment on receipt of shipment documents on FOB/ C&F Islamabad including PSI inspection / acceptance certificate duly signed by Director R&D and PSI team. |
| b. | Remaining 20% payment after satisfactory installation and commissioning of machine at purchaser's premises. |