



RETURN BIDS TO:

RETOURNER LES SOUMISSIONS À:

Bid Receiving - PWGSC / Réception des
soumissions - TPSGC

11 Laurier St./ 11 rue, Laurier

Place du Portage, Phase III

Core 0B2 / Noyau 0B2

Gatineau, Québec K1A 0S5

Bid Fax: (819) 997-9776

REQUEST FOR PROPOSAL DEMANDE DE PROPOSITION

Proposal To: Public Works and Government Services Canada

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

Proposition aux: Travaux Publics et Services Gouvernementaux Canada

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Vendor/Firm Name and Address

Raison sociale et adresse du

fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Scientific, Medical and Photographic Division / Division de
l'équipement scientifique, des produits photographiques et
pharmaceutiques

L'Esplanade Laurier

140 O'Connor Street,

East Tower, 7th Floor

Ottawa

Ontario

K1A 0S5

Title - Sujet Semiconductor Process Tools	
Solicitation No. - N° de l'invitation 31184-230439/A	Date 2022-07-14
Client Reference No. - N° de référence du client 31184-230439	
GETS Reference No. - N° de référence de SEAG PW-\$\$\$PV-899-81299	
File No. - N° de dossier pv899.31184-230439	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM Eastern Daylight Saving Time EDT on - le 2022-09-07 Heure Avancée de l'Est HAE	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Van Den Hanenberg, Stephen	Buyer Id - Id de l'acheteur pv899
Telephone No. - N° de téléphone (343) 540-8371 ()	FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: Specified Herein Précisé dans les présentes	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée See Herein – Voir ci-inclus	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

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PART 1 - GENERAL INFORMATION

1.1 Requirement

The requirement is detailed under Annex A.

1.2 Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

1.3 Canada Post Corporation's (CPC) Connect service

This bid solicitation allows bidders to use the CPC Connect service provided by Canada Post Corporation to transmit their bid electronically. Bidders must refer to Part 2 entitled Bidder Instructions, and Part 3 entitled Bid Preparation Instructions, of the bid solicitation, for further information.

1.4 Phased Bid Compliance Process

The Phased Bid Compliance Process applies to this requirement.

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2020-05-28) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: 60 days
Insert: 120 days

2.1.1 SACC Manual Clauses

SACC Manual clause B1000T (2014-06-26) Condition of Material

2.2 Submission of Bids

Bids must be submitted electronically either through CPC Connect system or Facsimile to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit, as specified below, by the date, and time indicated on page 1 of the bid solicitation.

PWGSC Bid Receiving Unit

Facsimile number: 819-997-9776

CPC Connect: tpsgc.pareceptiondessoumissions-apbidreceiving.pwgsc@tpsgc-pwgsc.gc.ca

Note: Bids will not be accepted if emailed directly to the above email address. This email address is to be used to open a CPC Connect conversation, as detailed in Standard Instructions [2003](#), or to send bids through a CPC Connect message if the bidder is using its own licensing agreement for CPC Connect service.

No bid shall be sent directly to the PWGSC Contracting Authority.

Due to the nature of the bid solicitation, hard copy bids (paper or soft copies on media) submitted to PWGSC will not be accepted.

2.3 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than ten (10) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated, and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

2.4 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidders.

2.5 Bid Challenge and Recourse Mechanisms

- (a) Several mechanisms are available to potential suppliers to challenge aspects of the procurement process up to and including contract award.
- (b) Canada encourages suppliers to first bring their concerns to the attention of the Contracting Authority. Canada's [Buy and Sell](#) website, under the heading "[Bid Challenge and Recourse Mechanisms](#)" contains information on potential complaint bodies such as:
 - Office of the Procurement Ombudsman (OPO)
 - Canadian International Trade Tribunal (CITT)
- (c) Suppliers should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Suppliers should therefore act quickly when they want to challenge any aspect of the procurement process.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

Canada requests that the Bidder submits its bid in accordance with section 08 of the 2003 standard instructions. The CPC Connect system has a limit of 1GB per single message posted and a limit of 20GB per conversation.

The bid must be gathered per section and separated as follows:

Section I: Technical Bid

Section II: Financial Bid

Section III: Certifications

If the Bidder is simultaneously providing copies of its bid using multiple acceptable delivery methods, and if there is a discrepancy between the wording of any of these copies and the electronic copy provided through CPC Connect service, the wording of the electronic copy provided through CPC Connect service will have priority over the wording of the other copies.

Due to the nature of the bid solicitation, hard copy bids (paper or soft copies on media) will not be accepted.

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that Bidders use a numbering system that corresponds to the bid solicitation.

Section I: Technical Bid

In their technical bid, Bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

The technical bid consists of the following:

- (a) **Supporting Technical documentation:** Bidders must include technical brochures or a technical data sheet to demonstrate compliancy to the requirement as described in Annex A.
- (b) **List of Products:** Bidders must include a complete product list identifying: the product name; the name of manufacturer; the model and part number of each component which make up the system. Bidders must also state the point of manufacture and shipping of goods or where service is to be performed: The bidder is requested to use the form provided in Annex C.

Section II: Financial Bid

- (a) **Pricing:** Bidders must submit their financial bid in accordance with the Basis of Payment including Annex B – Basis of Payment.

- (b) **All Costs to be Included:** The financial bid must include all costs for the requirement described in the bid solicitation for the entire Contract Period, including any option years. The identification of all necessary equipment, software, peripherals, cabling and components required to meet the requirements of the bid solicitation and the associated costs of these items is the sole responsibility of the Bidder.
- (c) **Blank Prices:** Bidders are requested to insert "\$0.00" for any item for which it does not intend to charge or for items that are already included in other prices set out in the tables. If the Bidder leaves any price blank, Canada will treat the price as "\$0.00" for evaluation purposes and may request that the Bidder confirm that the price is, in fact, \$0.00. No bidder will be permitted to add or change a price as part of this confirmation. Any bidder who does not confirm that the price for a blank item is \$0.00 will be declared non-responsive.

3.1.1 Electronic Payment of Invoices – Bid

If you are willing to accept payment of invoices by Electronic Payment Instruments, complete Attachment 3 Electronic Payment Instruments, to identify which ones are accepted.

If Attachment 3 Electronic Payment Instruments is not completed, it will be considered as if Electronic Payment Instruments are not being accepted for payment of invoices.

Acceptance of Electronic Payment Instruments will not be considered as an evaluation criterion.

3.1.2 Exchange Rate Fluctuation

SACC Manual clause [C3011T](#) (2013-11-06), Exchange Rate Fluctuation

3.1.3 Financial Capability

SACC Manual clause [A9033T](#) (2012-07-16) Financial Capability

3.1.4 SACC Manual Clauses

Section III: Certifications

Bidders must submit the certifications and additional information required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.
- (c) Canada will use the Phased Bid Compliance Process described below.

4.1.1 Phased Bid Compliance Process

4.1.1.1 (2018-07-19) General

- (a) Canada is conducting the PBCP described below for this requirement.
- (b) Notwithstanding any review by Canada at Phase I or II of the PBCP, Bidders are and will remain solely responsible for the accuracy, consistency and completeness of their Bids and Canada

does not undertake, by reason of this review, any obligations or responsibility for identifying any or all errors or omissions in Bids or in responses by a Bidder to any communication from Canada.

THE BIDDER ACKNOWLEDGES THAT THE REVIEWS IN PHASE I AND II OF THIS PBCP ARE PRELIMINARY AND DO NOT PRECLUDE A FINDING IN PHASE III THAT THE BID IS NON-RESPONSIVE, EVEN FOR MANDATORY.

REQUIREMENTS WHICH WERE SUBJECT TO REVIEW IN PHASE I OR II AND NOTWITHSTANDING THAT THE BID HAD BEEN FOUND RESPONSIVE IN SUCH EARLIER PHASE. CANADA MAY DEEM A BID TO BE NON-RESPONSIVE TO A MANDATORY REQUIREMENT AT ANY PHASE.

THE BIDDER ALSO ACKNOWLEDGES THAT ITS RESPONSE TO A NOTICE OR A COMPLIANCE ASSESSMENT REPORT (CAR) (EACH DEFINED BELOW) IN PHASE I OR II MAY NOT BE SUCCESSFUL IN RENDERING ITS BID RESPONSIVE TO THE MANDATORY REQUIREMENTS THAT ARE THE SUBJECT OF THE NOTICE OR CAR, AND MAY RENDER ITS BID NON-RESPONSIVE TO OTHER MANDATORY REQUIREMENTS.

- (c) Canada may, in its discretion, request and accept at any time from a Bidder and consider as part of the Bid, any information to correct errors or deficiencies in the Bid that are clerical or administrative, such as, without limitation, failure to sign the Bid or any part or to checkmark a box in a form, or other failure of format or form or failure to acknowledge; failure to provide a procurement business number or contact information such as names, addresses and telephone numbers; inadvertent errors in numbers or calculations that do not change the amount the Bidder has specified as the price or of any component thereof that is subject to evaluation. This shall not limit Canada's right to request or accept any information after the bid solicitation closing in circumstances where the bid solicitation expressly provides for this right. The Bidder will have the time period specified in writing by Canada to provide the necessary documentation. Failure to meet this deadline will result in the Bid being declared non-responsive.
- (d) The PBCP does not limit Canada's rights under Standard Acquisition Clauses and Conditions (SACC) 2003 (2020-05-28) Standard Instructions – Goods or Services – Competitive Requirements nor Canada's right to request or accept any information during the solicitation period or after bid solicitation closing in circumstances where the bid solicitation expressly provides for this right, or in the circumstances described in subsection (c).
- (e) Canada will send any Notice or CAR by any method Canada chooses, in its absolute discretion. The Bidder must submit its response by the method stipulated in the Notice or CAR. Responses are deemed to be received by Canada at the date and time they are delivered to Canada by the method and at the address specified in the Notice or CAR. An email response permitted by the Notice or CAR is deemed received by Canada on the date and time it is received in Canada's email inbox at Canada's email address specified in the Notice or CAR. A Notice or CAR sent by Canada to the Bidder at any address provided by the Bidder in or pursuant to the Bid is deemed received by the Bidder on the date it is sent by Canada. Canada is not responsible for late receipt by Canada of a response, however caused.

4.1.1.2 (2018-03-13) Phase I: Financial Bid

- (a) After the closing date and time of this bid solicitation, Canada will examine the Bid to determine whether it includes a Financial Bid and whether any Financial Bid includes all information required by the solicitation. Canada's review in Phase I will be limited to identifying whether any information that is required under the bid solicitation to be included in the Financial Bid is missing from the Financial Bid. This review will not assess whether the Financial Bid meets any standard or is responsive to all solicitation requirements.

- (b) Canada's review in Phase I will be performed by officials of the Department of Public Works and Government Services.
- (c) If Canada determines, in its absolute discretion that there is no Financial Bid or that the Financial Bid is missing all of the information required by the bid solicitation to be included in the Financial Bid, then the Bid will be considered non-responsive and will be given no further consideration.
- (d) For Bids other than those described in c), Canada will send a written notice to the Bidder ("Notice") identifying where the Financial Bid is missing information. A Bidder, whose Financial Bid has been found responsive to the requirements that are reviewed at Phase I, will not receive a Notice. Such Bidders shall not be entitled to submit any additional information in respect of their Financial Bid.
- (e) The Bidders who have been sent a Notice shall have the time period specified in the Notice (the "Remedy Period") to remedy the matters identified in the Notice by providing to Canada, in writing, additional information or clarification in response to the Notice. Responses received after the end of the Remedy Period will not be considered by Canada, except in circumstances and on terms expressly provided for in the Notice.
- (f) In its response to the Notice, the Bidder will be entitled to remedy only that part of its Financial Bid which is identified in the Notice. For instance, where the Notice states that a required line item has been left blank, only the missing information may be added to the Financial Bid, except that, in those instances where the addition of such information will necessarily result in a change to other calculations previously submitted in its Financial Bid, (for example, the calculation to determine a total price), such necessary adjustments shall be identified by the Bidder and only these adjustments shall be made. All submitted information must comply with the requirements of this solicitation.
- (g) Any other changes to the Financial Bid submitted by the Bidder will be considered to be new information and will be disregarded. There will be no change permitted to any other Section of the Bidder's Bid. Information submitted in accordance with the requirements of this solicitation in response to the Notice will replace, in full, **only** that part of the original Financial Bid as is permitted above, and will be used for the remainder of the bid evaluation process.
- (h) Canada will determine whether the Financial Bid is responsive to the requirements reviewed at Phase I, considering such additional information or clarification as may have been provided by the Bidder in accordance with this Section. If the Financial Bid is not found responsive for the requirements reviewed at Phase I to the satisfaction of Canada, then the Bid shall be considered non-responsive and will receive no further consideration.
- (i) Only Bids found responsive to the requirements reviewed in Phase I to the satisfaction of Canada, will receive a Phase II review.

4.1.1.3 (2018-03-13) Phase II: Technical Bid

- (a) Canada's review at Phase II will be limited to a review of the Technical Bid to identify any instances where the Bidder has failed to meet any Eligible Mandatory Criterion. This review will not assess whether the Technical Bid meets any standard or is responsive to all solicitation requirements. Eligible Mandatory Criteria are all mandatory technical criteria that are identified in this solicitation as being subject to the PBCP. Mandatory technical criteria that are not identified in the solicitation as being subject to the PBCP, will not be evaluated

until Phase III.

- (b) Canada will send a written notice to the Bidder (Compliance Assessment Report or "CAR") identifying any Eligible Mandatory Criteria that the Bid has failed to meet. A Bidder whose Bid has been found responsive to the requirements that are reviewed at Phase II will receive a CAR that states that its Bid has been found responsive to the requirements reviewed at Phase II. Such Bidder shall not be entitled to submit any response to the CAR.
- (c) A Bidder shall have the period specified in the CAR (the "Remedy Period") to remedy the failure to meet any Eligible Mandatory Criterion identified in the CAR by providing to Canada in writing additional or different information or clarification in response to the CAR. Responses received after the end of the Remedy Period will not be considered by Canada, except in circumstances and on terms expressly provided for in the CAR.
- (d) The Bidder's response must address only the Eligible Mandatory Criteria listed in the CAR as not having been achieved, and must include only such information as is necessary to achieve such compliance. Any additional information provided by the Bidder which is not necessary to achieve such compliance will not be considered by Canada, except that, in those instances where such a response to the Eligible Mandatory Criteria specified in the CAR will necessarily result in a consequential change to other parts of the Bid, the Bidder shall identify such additional changes, provided that its response must not include any change to the Financial Bid.
- (e) The Bidder's response to the CAR should identify in each case the Eligible Mandatory Criterion in the CAR to which it is responding, including identifying in the corresponding section of the original Bid, the wording of the proposed change to that section, and the wording and location in the Bid of any other consequential changes that necessarily result from such change. In respect of any such consequential change, the Bidder must include a rationale explaining why such consequential change is a necessary result of the change proposed to meet the Eligible Mandatory Criterion. It is not up to Canada to revise the Bidder's Bid, and failure of the Bidder to do so in accordance with this subparagraph is at the Bidder's own risk. All submitted information must comply with the requirements of this solicitation.
- (f) Any changes to the Bid submitted by the Bidder other than as permitted in this solicitation, will be considered to be new information and will be disregarded. Information submitted in accordance with the requirements of this solicitation in response to the CAR will replace, in full, **only** that part of the original Bid as is permitted in this Section.

- (g) Additional or different information submitted during Phase II permitted by this section will be considered as included in the Bid, but will be considered by Canada in the evaluation of the Bid at Phase II only for the purpose of determining whether the Bid meets the Eligible Mandatory Criteria. It will not be used at any Phase of the evaluation to increase any score that the original Bid would achieve without the benefit of such additional or different information. For instance, an Eligible Mandatory Criterion that requires a mandatory minimum number of points to achieve compliance will be assessed at Phase II to determine whether such mandatory minimum score would be achieved with such additional or different information submitted by the Bidder in response to the CAR. If so, the Bid will be considered responsive in respect of such Eligible Mandatory Criterion, and the additional or different information submitted by the Bidder shall bind the Bidder as part of its Bid, but the Bidder's original score, which was less than the mandatory minimum for such Eligible Mandatory Criterion, will not change, and it will be that original score that is used to calculate any score for the Bid
- (h) Canada will determine whether the Bid is responsive for the requirements reviewed at Phase II, considering such additional or different information or clarification as may have been provided by the Bidder in accordance with this Section. If the Bid is not found responsive for the requirements reviewed at Phase II to the satisfaction of Canada, then the Bid shall be considered non-responsive and will receive no further consideration.
- (i) Only Bids found responsive to the requirements reviewed in Phase II to the satisfaction of Canada, will receive a Phase III evaluation.

4.1.1.4 (2018-03-13) Phase III: Final Evaluation of the Bid

- (a) In Phase III, Canada will complete the evaluation of all Bids found responsive to the requirements reviewed at Phase II. Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) A Bid is non-responsive and will receive no further consideration if it does not meet all mandatory evaluation criteria of the solicitation.

4.1.2 (2017-07-31) Technical Evaluation

4.1.2.1 (2017-07-31) Mandatory and Point Rated Technical Criteria

The Phased Bid Compliance Process will apply only to the Mandatory Technical Requirements.

4.1.3 Financial Evaluation

The financial evaluation will be conducted by calculating the Total Aggregated Bid Price in accordance with the pricing tables provided in Annex B – Basis of Payment.

Evaluation of Price

The price of the offer will be evaluated in Canadian dollars, Applicable Taxes excluded, DAP Ottawa Incoterms® 2010, Canadian customs duties and taxes included.

Unless the solicitation specifically requires offers to be submitted in Canadian currency, offers submitted in foreign currency will be converted to Canadian currency for evaluation purposes. The rate given by the Bank of Canada in effect on the request for standing offer closing date, or on another date specified in the Standing Offer, will be applied as a conversion factor to the offers submitted in foreign currency.

4.2 Basis of Selection - Highest Combined Rating of Technical Merit and Price

4.2.1 To be declared responsive, a bid must:

- (a) comply with all the requirements of the bid solicitation; and
- (b) meet all mandatory technical requirements.

4.2.2 Bids not meeting (a) or (b) will be declared non-responsive.

4.2.3 The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 20% for the technical merit and 80% for the price.

4.2.4 To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows:

$$\frac{\text{Total technical points obtained}}{\text{Maximum number of available points (54)}} \times 20 = \text{Technical Merit Score}$$

4.2.5 To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 80%. The responsive bid with the lowest Total Aggregated Bid Price (TABP) is given full price points, while other bids receive a pro-rated score based on the ratio of the lowest evaluated bid to their total bid price, as follows:

$$\frac{\text{Lowest Responsive TABP} \times 40}{\text{Bidders TABP}} = \text{Pricing Score}$$

4.2.6 For each responsive bid, the technical merit score and the pricing score will be added to determine its combined rating.

4.2.7 Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.

4.2.8 In the event that two or more responsive bids have resulted in the same highest combined rating, the responsive bid with the highest technical score will be recommended for award of a contract.

The table below illustrates an example where all three bids are responsive and the selection of the contractor is determined by a 20/80 ratio of technical merit and price, respectively. The total available points equals 54 and the lowest evaluated price is \$1,500,000.00.

Example

		Bidder 1	Bidder 2	Bidder 3
Overall Technical Score		40/54	26/54	22/54
Bid Evaluated Price		\$1,500,000.00	\$1,600,000.00	\$1,550,000.00
Calculations	Technical Merit Score	40/54 x 20 = 14.81	26/54 x 20 = 9.63	22/54 x 20 = 8.15
	Pricing Score	1,500,000.00/1,500,000.00 x 80 = 80	1,500,000.00/1,600,000.00 x 80 = 75	1,500,000.00/1,550,000.00 x 80 = 77.42

Solicitation No. - N° de l'invitation
31184-230439/A
Client Ref. No. - N° de réf. du client
31184-230439

Amd. No. - N° de la modif.
File No. - N° du dossier
pv899. 31184-230439

Buyer ID - Id de l'acheteur
pv899
CCC No./N° CCC - FMS No./N° VME

Combined Rating	94.81	84.63	85.57
Overall Rating	1st	3rd	2nd

PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the declaration form available on the Forms for the Integrity Regime website (<http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html>), to be given further consideration in the procurement process.

5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid, but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame provided will render the bid non-responsive.

5.2.1 Integrity Provisions – Required Documentation

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real property agreement of the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html>).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

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31184-230439

Amd. No. - N° de la modif.
File No. - N° du dossier
pv899. 31184-230439

Buyer ID - Id de l'acheteur
pv899
CCC No./N° CCC - FMS No./N° VME

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](#)" list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed annex [Federal Contractors Program for Employment Equity - Certification](#), before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

5.2.3 Additional Certifications Precedent to Contract Award

5.2.3.1 Product Conformance

The Bidder certifies that all goods proposed conform, and will continue to conform throughout the period of the contract, to the requirement detailed under Annex A.

Bidder's authorized representative signature

Date

5.2.3.2 OEM Certification

(i) Any Bidder that is not the Original Equipment Manufacturer (OEM) for every item of hardware or equipment proposed as part of its bid is required to submit the OEM's certification regarding the Bidder's authority to provide and maintain the OEM's hardware or equipment, which must be signed by the OEM (not the Bidder). No Contract will be awarded to a Bidder who is not the OEM of the hardware or equipment it proposes to supply to Canada, unless the OEM certification has been provided to Canada. Bidders are requested to use the OEM Certification Form included with the bid solicitation at of the Bid Solicitation. Although all the contents of the OEM Certification Form are required, using the form itself to provide this information is not mandatory. For Bidders/OEMs who use an alternate form, it is in Canada's sole discretion to determine whether all the required information has been provided. Alterations to the statements in the form may result in the bid being declared non-responsive.

(ii) If the hardware or equipment proposed by the Bidder originates with multiple OEMs, a separate OEM certification is required from each OEM.

(iii) For the purposes of this bid solicitation, OEM means the manufacturer of the hardware or equipment, as evidenced by the name appearing on the hardware or equipment and on all accompanying documentation.

PART 6 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

6.1 Security Requirements

6.1.1 There is no security requirement applicable to the Contract.

6.2 Requirement

6.2.1 Requirement

The Contractor must provide the items detailed under the "Requirement" at Annex A.

6.2.2 Optional Requirement

- a) **Option to Purchase Extended Warranty, Maintenance and Support Services:** The Contractor grants to Canada the irrevocable option to extend the warranty, maintenance and support services period by one additional one-year period, exercisable at any time during the Contract Period, under the same terms and conditions and at the prices and/or rates stated in the Contract.

6.3 Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

6.3.1 General Conditions

[2010A](#) (2021-12-02), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

The [2010A](#) (2021-12-02), General Conditions - Goods (Medium Complexity) is appended with Section 33 - Intellectual Property Infringement and Royalties, as follows:

- 1) The Contractor represents and warrants that, to the best of its knowledge, neither it nor Canada will infringe any third party's intellectual property rights in performing or using the Work, and that Canada will have no obligation to pay royalties of any kind to anyone in connection with the Work.
- 2) If anyone makes a claim against Canada or the Contractor concerning intellectual property infringement or royalties related to the Work, that Party agrees to notify the other Party in writing immediately. If anyone brings a claim against Canada, according to [Department of Justice Act](#), R.S. 1985, c. J-2, the Attorney General of Canada must have the regulation and conduct of all litigation for or against Canada, but the Attorney General may request that the Contractor defend Canada against the claim. In either case, the Contractor agrees to participate fully in the defence and any settlement negotiations and to pay all costs, damages and legal costs incurred or payable as a result of the claim, including the amount of any settlement. Both Parties agree not to settle any claim unless the other Party first approves the settlement in writing.

- 3) The Contractor has no obligation regarding claims that were only made because:
- (a) Canada modified the Work or part of the Work without the Contractor's consent or used the Work or part of the Work without following a requirement of the Contract; or
 - (b) Canada used the Work or part of the Work with a product that the Contractor did not supply under the Contract (unless that use is described in the Contract or the manufacturer's specifications); or
 - (c) the Contractor used equipment, drawings, specifications or other information supplied to the Contractor by Canada (or by someone authorized by Canada); or
 - (d) the Contractor used a specific item of equipment or software that it obtained because of specific instructions from the Contracting Authority; however, this exception only applies if the Contractor has included the following language in its own contract with the supplier of that equipment or software: "[Supplier name] acknowledges that the purchased items will be used by the Government of Canada. If a third party claims that equipment or software supplied under this contract infringes any intellectual property right, [supplier name], if requested to do so by either [Contractor name] or Canada, will defend both [Contractor name] and Canada against that claim at its own expense and will pay all costs, damages and legal fees payable as a result of that infringement." Obtaining this protection from the supplier is the Contractor's responsibility and, if the Contractor does not do so, it will be responsible to Canada for the claim.
- 4) If anyone claims that, as a result of the Work, the Contractor or Canada is infringing its intellectual property rights, the Contractor must immediately do one of the following:
- (a) take whatever steps are necessary to allow Canada to continue to use the allegedly infringing part of the Work; or
 - (b) modify or replace the Work to avoid intellectual property infringement, while ensuring that the Work continues to meet all the requirements of the Contract; or
 - (c) take back the Work and refund any part of the Contract Price that Canada has already paid.

If the Contractor determines that none of these alternatives can reasonably be achieved, or if the Contractor fails to take any of these steps within a reasonable amount of time, Canada may choose either to require the Contractor to do (c), or to take whatever steps are necessary to acquire the rights to use the allegedly infringing part(s) of the Work itself, in which case the Contractor must reimburse Canada for all the costs it incurs to do so.

6.3.2 Additional General Conditions

6.3.2.1 Conduct of the Work

- 1) The Contractor represents and warrants that:
 - a. it is competent to perform the Work;
 - b. it has everything necessary to perform the Work, including the resources, facilities, labour, technology, equipment, and materials; and
 - c. it has the necessary qualifications, including knowledge, skill, know-how and experience, and the ability to use them effectively to perform the Work.
- 2) The Contractor must:

- a. perform the Work diligently and efficiently;
- b. except for Government Property, supply everything necessary to perform the Work;
- c. use, as a minimum, quality assurance procedures, inspections and controls generally used and recognized by the industry to ensure the degree of quality required by the Contract;
- d. select and employ a sufficient number of qualified people;
- e. perform the Work in accordance with standards of quality acceptable to Canada and in full conformity with the specifications and all the requirements of the Contract;
- f. provide effective and efficient supervision to ensure that the quality of workmanship meets the requirements of the Contract.

6.3.2.2 Harassment in the workplace

- 1) The Contractor acknowledges the responsibility of Canada to ensure, for its employees, a healthy work environment, free of harassment. A copy of the [Policy on Harassment Prevention and Resolution](#), which is also applicable to the Contractor, is available on the Treasury Board Web site.
- 2) The Contractor must not, either as an individual, or as a corporate or unincorporated entity, through its employees or subcontractors, harass, abuse, threaten, discriminate against or intimidate any employee, contractor or other individual employed by, or under contract with Canada. The Contractor will be advised in writing of any complaint and will have the right to respond in writing. Upon receipt of the Contractor's response, the Contracting Authority will, at its entire discretion, determine if the complaint is founded and decide on any action to be taken.

6.3.2.3 Access to information

Records created by the Contractor, and under the control of Canada, are subject to the [Access to Information Act](#). The Contractor acknowledges the responsibilities of Canada under the [Access to Information Act](#) and must, to the extent possible, assist Canada in discharging these responsibilities. Furthermore, the Contractor acknowledges that section 67.1 of the [Access to Information Act](#) provides that any person, who destroys, alters, falsifies or conceals a record, or directs anyone to do so, with the intent of obstructing the right of access that is provided by the [Access to Information Act](#) is guilty of an offence and is liable to imprisonment or a fine, or both.

6.3.3 Supplemental General Conditions

- | | |
|-------------------|--|
| 4001 (2015-04-01) | Hardware Purchase, Lease and Maintenance. |
| 4003 (2010-08-16) | Licensed Software; and |
| 4004 (2013-04-25) | Maintenance and Support Services for Licensed Software |

apply to and form part of the Contract.

6.3.1. 4013 (2021-11-29) Compliance with on-site measures, standing orders, policies, and rules

The Contractor must comply and ensure that its employees and subcontractors comply with all security measures, standing orders, policies or other rules in force at the site where the Work is performed.

6.3.2 4014 (2021-11-29) Suspension of the work

1. The Contracting Authority may at any time, by written notice, order the Contractor to suspend or stop the Work or part of the Work under the Contract for a period of up to 180 days. The Contractor must immediately comply with any such order in a way that minimizes the cost of doing so. While such an order is in effect, the Contractor must not remove any part of the Work from any premises without first obtaining the written consent of the Contracting Authority. Within these 180 days, the Contracting Authority must either cancel the order or terminate the Contract, in whole or in part, under section(s) 23 (2104-09-25) entitled Default by the Contractor or 24 (2020-05-28) entitled Termination for convenience of general conditions 2010A (2022-01-28), General conditions: Goods (medium complexity).
2. When an order is made under subsection 1, unless the Contracting Authority terminates the Contract by reason of default by the Contractor or the Contractor abandons the Contract, the Contractor will be entitled to be paid its additional costs incurred as a result of the suspension plus a fair and reasonable profit.
3. When an order made under subsection 1 is cancelled, the Contractor must resume work in accordance with the Contract as soon as practicable. If the suspension has affected the Contractor's ability to meet any delivery date under the Contract, the date for performing the part of the Work affected by the suspension will be extended for a period equal to the period of suspension plus a period, if any, that in the opinion of the Contracting Authority, following consultation with the Contractor, is necessary for the Contractor to resume the Work. Any equitable adjustments will be made as necessary to any affected conditions of the Contract.

6.4 Term of Contract

6.4.1 Period of the Contract

- (a) The period of the Contract begins on the date the Contract is awarded and ends 12 months after Tool #6 is accepted.
- (b) The period during which the Contract is extended, if Canada chooses to exercise any options set out in the Contract.

6.4.2 Delivery Date

The first Tool must be delivered within 40 weeks of contract award. Unless otherwise arranged and agreed upon in writing between the Contractor and the Technical Authority, each Tool thereafter must be delivered in 90 day intervals to allow NRC ample time to prepare the site for acceptance and commissioning.

The Contractor must deliver each on-site training session within 45 days of installation completion of each Tool.

6.4.3 Delivery Points

Delivery of the requirement will be made to delivery point(s) specified at Annex A of the Contract.

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Stephen Van Den Hanenberg
Title: Supply Officer

Public Works and Government Services Canada

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31184-230439/A
Client Ref. No. - N° de réf. du client
31184-230439

Amd. No. - N° de la modif.
File No. - N° du dossier
pv899. 31184-230439

Buyer ID - Id de l'acheteur
pv899
CCC No./N° CCC - FMS No./N° VME

Pharmaceuticals Procurement Directorate
140 O'Connor Street, 7th floor
L'Esplanade Laurier (LEL), East Tower
Ottawa, Ontario, K1A 0R5

Telephone: 343-540-8371

E-mail address: stephen.vandenhaneberg@pwgsc-tpsgc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

6.5.2 Technical Authority *(to be filled in only at contract award)*

The Technical Authority for the Contract is: *(to be filled in only at contract award)*

Name: _____
Title: _____
Organization: _____
Address: _____

Telephone: _____
E-mail address: _____

The Technical Authority named above is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

6.5.3 Contractor's Accounts Payable Contact *(to be filled at contract award)*

Name: _____
Telephone: _____
E-mail address: _____

6.5.4 Contractor's Representative *(to be completed by the bidder)*

The telephone number (with extension if applicable) of the person responsible for:

General enquiries

Name: _____
Tel. No. _____ ext: _____
E-mail address: _____

Delivery Follow-up

Name: _____
Tel. No. _____ ext: _____
E-mail address: _____

6.6 Payment

6.6.1 Basis of Payment

6.6.1.1 Initial Requirement

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid firm lot prices as specified in Annex B – Basis of Payment for a cost of \$_____ CAD **(to be filled in only at contract award)**. Customs duties are included and Applicable Taxes are extra.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

6.6.1.2 Optional Extended Warranty, Maintenance and Support Services

For the option to purchase Extended Warranty, Maintenance and Support Services as specified in Annex A, Canada will pay the Contractor the firm price set out in Annex B – Basis of Payment, Table 2. Applicable Taxes are extra.

6.6.2 SACC Manual Clauses

SACC Manual clause **C2000C** (2007-11-30) Taxes - Foreign-Based Contractor
SACC Manual clause **H1001C** (2008-05-12) Multiple Payment

6.6.3 Electronic Payment of Invoices – Contract

The Contractor accepts to be paid using any of the following Electronic Payment Instrument(s):

- a. Visa Acquisition Card;
- b. MasterCard Acquisition Card;
- c. Direct Deposit (Domestic and International);
- d. Electronic Data Interchange (EDI);
- e. Wire Transfer (International Only);

6.7 Invoicing Instructions

6.7.1 The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.

6.7.2 Invoices must be distributed as follows:

- (a) The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment.
- (b) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.
- (c) Invoices and order confirmations can be sent via e-mail to:
_____ **(to be filled in at contract award)**
- (d) To facilitate the payment process, it is important that the Contractor quote the contract number on all the invoices, shipping bills and packing slips. Failure to

do so will delay payment and the date used for calculating interest on overdue accounts.

6.8 Certifications and Additional Information

6.8.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

6.8.2 Federal Contractors Program for Employment Equity - Default by the Contractor

The Contractor understands and agrees that, when an Agreement to Implement Employment Equity (AIEE) exists between the Contractor and Employment and Social Development Canada (ESDC)-Labour, the AIEE must remain valid during the entire period of the Contract. If the AIEE becomes invalid, the name of the Contractor will be added to the "FCP Limited Eligibility to Bid" list. The imposition of such a sanction by ESDC will constitute the Contractor in default as per the terms of the Contract.

6.9 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

6.10 Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) the supplemental general conditions:
 - i. 4001, (2015-04-01) Hardware Purchase, Lease and Maintenance;
 - ii. 4003, (2010-08-16) Licensed Software;
 - iii. 4004, (2013-04-25) Maintenance and Support Services for Licensed Software
- (c) the general conditions 2010A General Conditions - Goods (Medium Complexity);
- (d) Annex A, Requirement;
- (e) Annex C, List of Products;
- (f) Annex B, Basis of Payment; and
- (g) the Contractor's bid dated _____ (*insert date of bid*).

6.11 SACC Manual Clauses

SACC Manual clause A2000C (2006-06-16) Foreign Nationals (Canadian Contractor)
SACC Manual clause A2001C (2006-06-16) Foreign Nationals (Foreign Contractor)
SACC Manual clause A9068C (2010-01-11) Government Site Regulations
SACC Manual clause D9002C (2007-11-30) Incomplete Assemblies
SACC Manual clause G1005C (2016-01-28) Insurance - No Specific Requirement

6.12 Shipping Instructions

6.12.1 Shipping Instructions - Shipping Instructions - Delivery at Place

The Contractor is responsible for the delivery of goods, packaging the shipment, including readying the goods for transport up to the named place of the destination. The seller assumes all risks involved up to the unloading point. The National Research Council Canada will be responsible for arranging customs clearance and paying applicable duties, taxes, transportation fees and import fees.

- a) Goods must be consigned to the destination specified in the Contract and delivered:

Delivery at Place (DAP) Ottawa, ON Incoterms® 2010 for shipments from a commercial contractor.

- b) Ship packages less than 150 lbs via FEDEX International Priority on account #463758905.
c) If weight exceeds 150 lbs or size dictates, ship via TST Overland: (888) 878-9229 collect on account # 0220565.
d) Do not ship via UPS or DHL.
e) Contact NRC Customs Contacts as follows if carrier options aren't available:

Daniel Frampton; 613-993-9113; Daniel.frampton@nrc-cnrc.gc.ca
Christian Latreille; 613-993-2259; Christian.Latreille@nrc-cnrc.gc.ca

6.13 Dispute Resolution

- (a) The parties agree to maintain open and honest communication about the Work throughout and after the performance of the contract.
- (b) The parties agree to consult and co-operate with each other in the furtherance of the contract and promptly notify the other party or parties and attempt to resolve problems or differences that may arise.
- (c) If the parties cannot resolve a dispute through consultation and cooperation, the parties agree to consult a neutral third party offering alternative dispute resolution services to attempt to address the dispute.
- (d) Options of alternative dispute resolution services can be found on Canada's Buy and Sell website under the heading "[Dispute Resolution](#)".

ANNEX A

REQUIREMENT

Title

Advance Technology Facility Process Tools

Background

The National Research Council's (NRC) Advanced Electronics and Photonics Research Centre (AEP) has multiple world class wafer fabrication facilities. The Canadian Photonics Fabrication Centre (CPFC) provides world-class engineering and manufacturing services on full wafers, commercial-grade prototyping and pilot-run production facilities. The Advanced Technology Facility (ATF) is the R&D focused fabrication facility that conducts pioneering research in novel materials, designs and devices that support NRC's internal R&D activities and programs, and NRC's National and International collaborations in photonic devices, photonic integrated circuits and compound semiconductors.

A core capability that enables the ATF to fulfil its role in R&D is the ability to safely fabricate structures on both small material sample materials and on whole wafers which are then used to advance fundamental and applied research at AEP.

List of Acronyms

ICP – Inductively Coupled Plasma
ICPCD – Inductively Coupled Plasma Chemical Deposition
ALE – Atomic Layer Etch
PECVD – Plasma Enhanced Chemical Vapor Deposition
ALD – Atomic Layer deposition
Rf – Radio frequency
MFC – Mass Flow Control
LN₂ – Liquid Nitrogen
TDMAH - [(CH₃)₂N]₄Hf

Requirement

The National Research Council Canada (NRC) has a requirement for six (6) Semiconductor Process Tools (hereby referred to as the "Tools"), described as follows:

- | | |
|----------------|--|
| Tool #1 | Inductively Coupled Plasma Chemical Deposition and Inductively Coupled Plasma Etch Cluster tool.
1.1 Chamber #1 - Inductively Coupled Plasma Chemical Deposition
1.2 Chamber #2 - Inductively Coupled Plasma Etch and Atomic layer etching |
| Tool #2 | Plasma Enhanced Chemical Vapor Deposition (PECVD) Dielectric films |
| Tool #3 | Plasma Enhanced Chemical Vapor Deposition (PECVD) Amorphous Silicon |
| Tool #4 | Inductively Coupled Plasma Etch (ICP) of Silicon using Bosch™ and Cryogenic etching. |
| Tool #5 | Inductively Coupled Plasma Etch (ICP) of III/V compound semiconductors and dielectrics using Halide and Fluoride chemistries. |
| Tool #6 | Atomic Layer Deposition (ALD) of HfO ₂ , Al ₂ O ₃ and SiO ₂ |

The Contractor must provide all of the following:

- (i) Six (6) Semiconductor Process Tools including all power cords, cables, operational software and accessories;
- (ii) Configuration and Installation Plan;
- (iii) Delivery at Place;

- (iv) Installation;
- (v) Documentation;
- (vi) Training; and
- (vii) One Year Warranty including Maintenance and Support Services.

The requirement also includes the option to purchase Extended Warranty, Maintenance and Support Services for up to one additional one-year period.

The Tools must work and operate at all times in accordance with the following mandatory technical requirements:

General Requirements for all six Tools

- (i) Tools must be certified by an organization accredited by the Standards Council of Canada in accordance with Part I of the Canadian Electrical Code; or has been inspected by an organization acceptable to the Chief Electrical Inspector in the province, territory or city in Canada where the electrical equipment will be delivered, in which case the Contractor must present evidence of this inspection if requested by Canada;
- (ii) The Contractor must have exclusive ownership of, and rights to use the intellectual property (IP) for the tools and processes used;
- (iii) Each Tool must be equipped with it's operational software;
- (iv) The NRC has standardized dry roughing pumps from the manufacturer Ebara; all six tools must be delivered with Ebara manufactured pumps;
- (v) Tools must be installed thru-the-wall in a Bulkhead configuration with access from the right handside for service when viewed from the cleanroom side;
- (vi) Tools must operate on 208V 60Hz 3Phase;
- (vii) Tools require a minimum of 10 meter power distribution cabling between the control rack electronics and the process chamber to allow for remote location of control rack;
- (viii) Tools require a minimum of 10 meter power distribution cabling between the pump and the control rack;
- (ix) Tools with the exception of Tool #4 require a minimum of 5 meter power distribution cabling from the control rack to the gas pod;
- (x) Tools must have a vacuum load lock for single wafers transfer to the process chamber(s) for wafers up to 200mm;
- (xi) Tools must provide slow pump and venting to prevent movement of pieces when carriers are used;
- (xii) Tools must be manufactured by the same manufacturer;
- (xiii) Tools 1 to 5 must share a common user interface.

Mandatory Technical Requirements

Tool #1 | Inductively Coupled Plasma Chemical Deposition and Inductively Coupled Plasma Etch Cluster and Atomics Layer Etch tool

1.1 Tool#1: Chamber #1 Inductively Coupled Plasma Chemical Deposition

1	The Tool must be equipped with a high frequency Rf generator (300W 13.56Mhz) on lower electrode;
2	The Tool must include an Inductively Coupled Plasma (ICP) Rf generator (3kW 2MHz) for remote plasma generation;
3	The Tool must have a gas supply pod which must support up to 8 Mass Flow Controllers;
4	The Tool must provide process gas handling for all of the following: SiH ₄ , N ₂ , N ₂ O, O ₂ , He, Ar, HN ₃ , CF ₄ ;
5	The Tool must have a liquid N ₂ cooled chuck with an operating temperature range from - 150°C to 400°C, inclusive; and

6	The Tool must have a deposition operating temperature range between 20°C and 400°C, inclusive.
---	--

1.2 Tool #1 Chamber #2: Inductively Coupled Plasma Etch and Atomic layer etching

1	The Tool must include a High frequency Rf generator (300W 13.56Mhz) on lower electrode for etch process;
2	The Tool must have an Inductively Coupled Plasma Rf generator (3kW 2MHz) for remote plasma generation;
3	The Tool must include Electrostatic shielding of the Inductively Coupled Plasma plasma source;
4	The Tool must provide mechanical clamping of 75mm, 100mm, 150mm wafers to the lower electrode;
5	The Tool must have a gas supply pod to support up to 12 Mass Flow Controllers;
6	The Tool must include heated distribution lines for low vapor pressure gases;
7	The Tool must provide process gas handling for all of the following: SiCl ₄ , HBr, CL ₂ , BCL ₃ , CH ₄ , N ₂ , He, H ₂ , Ar, O ₂ , CHF ₃ ;
8	The Tool must include a liquid N ₂ cooled chuck with an operating temperature range from -150°C to 400°C, inclusive;
9	The Tool must have a substrate bias control bias control range of 0.2W to 30W, inclusive;
10	The Tool must conduct an Atomic Layer Etching cycle with a pulse duration of 10ms;
11	The Tool must have an Integrated Spectroscopic endpoint detection with an operating wavelength of 200nm to 800nm, inclusive, with sensitivity control to 1% open area;

Tool #2: Plasma Enhanced Chemical Vapor Deposition (PECVD) Dielectric films

1	The Tool must include Low frequency Rf generator (500W 100Khz) for PECVD stress control on upper electrode;
2	The Tool must include High frequency Rf generator (600W 13.56MHz) for PECVD deposition;
3	The Tool must operate at 300-700°C on the lower electrode;
4	The Tool must have a gas supply pod to support up to 8 Mass Flow Controllers;
5	The Tool must have a heated pump down line, foreline and chamber to reduce deposition;
6	The Tool must have the Integration of spectroscopic endpoint detection (200-850nm) with the ability to monitor 3 user specified wavelengths and full spectrum without hardware reconfiguration;
7	The Tool must provide process gas handling for all of the following: SiH ₄ , N ₂ , N ₂ O, He, Ar, HN ₃ , CF ₄ , CH ₄ ;

Tool #3 | Plasma Enhanced Chemical Vapor Deposition (PECVD) Amorphous Silicon

1	The Tool must have a low frequency Rf generator (500W 100Khz) for PECVD stress control on upper electrode;
2	The Tool must have a high frequency Rf generator (600W 13.56MHz) for PECVD deposition;
3	The Tool must operate at 300-700°C on the lower electrode;
4	The Tool must have a gas supply pod to support up to 8 Mass Flow Controllers;
5	The Tool must have heated pump down line, foreline and chamber to reduce deposition;
6	The Tool must have the integration of spectroscopic endpoint detection (200-850nm) with the ability to monitor 3 user specified wavelengths and full spectrum without hardware reconfiguration;
7	The Tool must provide process gas handling for the following: SiH ₄ , N ₂ , N ₂ O, He, HN ₃ , CF ₄ ;

Tool #4 | Inductively Coupled Plasma Etch (ICP) of Silicon using Bosch™ and Cryogenic etching.

1	The Tool must have a low frequency Rf generator (300W 100Khz) for etch bias control on lower electrode;
2	The Tool must have a high frequency Rf generator (300W 13.56MHz) for etch process;
3	The Tool must have an Inductively Coupled Plasma Rf generator (5kW 2MHz) for remote plasma generation;

4	The Tool must provide mechanical clamping of 75mm, 100mm, 150mm wafers to the lower electrode;
5	The Tool must have a close coupled gas pod to support up to 6 Mass Flow Controllers;
6	The Tool must have LN ₂ cooling of lower electrode with automatic switching over to heating mode;
7	The Tool must switch between silicon etching and dielectric etching without any need for hardware reconfiguration;
8	The Tool must switch between Bosch and Cryogenic etching capabilities across a temperature range of -150°C to 400°C, inclusive, without any need for hardware reconfiguration;
9	The Tool must have heated distribution lines for low vapor pressure gases;
10	The Tool must provide process gas handling for all of the following: SF ₆ , O ₂ , Ar, C ₄ F ₈ , CHF ₃ ;
11	The Tool must have an Integrated Spectroscopic endpoint detection with an operating wavelength of 200nm to 800nm, inclusive, with sensitivity control to 0.5% open area;
Tool #5 Inductively Coupled Plasma Etch (ICP) of III/V and dielectrics using Halide and Fluoride chemistries.	
1	The Tool must have a 3KW 2MHz Rf Inductively Coupled Plasma source for generation for remote high density plasma;
2	The Tool must have a Rf generator (600W 13.56MHz) for etch process;
3	The Tool must have a gas supply pod to support up to 12 Mass Flow Controllers;
4	The Tool must include an liquid N ₂ cooled chuck with an operating temperature range from -150°C to 400°C, inclusive;
5	The Tool must have the Integration of spectroscopic endpoint detection (200-850nm) with the ability to monitor 3 user specified wavelengths and full spectrum without hardware reconfiguration;
6	The Tool must have heated distribution lines for low vapor pressure gases;
7	The Tool must provide mechanical clamping of 75mm, 100mm, 150mm wafers to the lower electrode
8	The Tool must provide process Gas handling for the following: HBr, Cl ₂ , BCl ₃ , CH ₄ , N ₂ , He, Ar, H ₂ , O ₂ , CHF ₃ , CF ₄ , C ₄ F ₈ ;
Tool #6 Atomic Layer Deposition (ALD) of HfO₂, Al₂O₃ and SiO₂	
1	The Tool must have a high frequency Rf generator (300W 13.56Mhz) for bias control on lower electrode;
2	The Tool must have high frequency Rf generator (600W 13.56MHz) for remote Inductively Coupled Plasma generation;
3	The Tool must have a gas supply pod to support up to 8 Mass Flow Controllers;
4	The Tool must have the capability of combined mixing of thermal and remote plasma assisted deposition techniques in one process recipe without any hardware reconfiguration;
5	The Tool must have a precursor bubbler cabinet to support up to 3 bubblers with individual temperature control up to 200°C for up to 3 solid precursors;
6	The Tool must have a lower Rf biased electrode which can operate up to 550°C;
7	The Tool must have a platen temperature uniformity of better than +/- 1°C;
8	The Tool must run plasma deposition processes at 10mTorr;
9	The Tool must provide process Gas handling for the following: N ₂ , Ar, O ₂ , H ₂ , SF ₆ ;
10	The Tool must utilize the following chemistry: Trimethylaluminium, Bis(tert-butylamino) silane, TDMAH, H ₂ O;

Configuration and Installation Plan

Prior to delivery of the first Tool, the Contractor must provide the Technical Authority with a Configuration and Installation Plan. Should the Technical Authority request revisions, the revised Configuration and Installation Plan must be provided to the Technical Authority for further review. Delivery of the first Tool

must not take place until the Contractor receives written notification to proceed from the Technical Authority. In no event will the Contractor be paid for unauthorized work.

Delivery Point

National Research Council Canada
BLDG M50
1200 Montreal Rd.
Ottawa, ON
K1A 0R6

Installation

The Contractor must supply all associated materials required to effectively complete the installation, integration and configuration of the deliverables at the site. This must include but not be limited to such things as all the required power connectors, cables, and any other accessories required to install, integrate and configure the deliverables.

Upon successful completion of the installation, integration and configuration of the deliverables, the Contractor must provide the Technical Authority with written notification that the deliverables are ready for testing. The Contractor must maintain all work areas at the installation site(s) in a clean and tidy condition on completion of each day's work and on completion of acceptance, including the removal and disposal of all related packing material.

Documentation

The contractor must provide Documentation, including all publications pertaining to technical specifications, installation requirements and the operating instructions, in English, in PDF with each of the Tools.

Training

The Contractor must provide on-site training in English for the following audience:

End User (up to six): training must include operation, routine maintenance and manipulation of each Tool. The training should include but not be limited to product functionality, product features and limitations.

The Contractor must deliver each on-site training session within 45 days of installation completion of each Tool.

Warranty, Maintenance and Support Services

The Contractor must provide one year of Warranty including Maintenance and Support Services in accordance with supplemental general conditions [4001 \(2015-04-01\), Hardware Purchase, Lease and Maintenance](#). All maintenance and support services must be completed on site.

The Contractor must include one visit of a field service engineer and one annual preventative maintenance kit per process chamber, per year of warranty.

ATTACHMENT 1

Although the bidders must propose Tools that meet all the specifications described in Annex A Mandatory Technical Requirements, bids will be evaluated on the following technical performance requirements.

A bid must comply with all of the requirements listed below at the conditions listed below and meet all mandatory performance evaluation criteria to be declared responsive. Bidders must present their process performance data in a clear and concise format. Simply stating that the criteria are met is not sufficient. Bidders are requested to cross reference the mandatory technical criteria to their supporting technical documentation.

Note: Definitions of formula used.

- (1) Within Wafer Uniformity = (Max-Min)/ (2* Average) (%)
- (2) Wafer to wafer uniformity (Repeatability) = (Max-Min)/ (2* Average) (%)

Tool #1 Chamber #1 must perform to the following specifications:

SiO₂ deposition	Process conditions
Deposition rate	≥15nm/min
Deposition temperature	150°C

Criteria	SiO₂ deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M1	Within wafer uniformity ⁽¹⁾	≤2%	
M2	Wafer to wafer uniformity ⁽²⁾	≤3%	
M3	Refractive index @ 632.8nm	1.46	
M4	Refractive index uniformity	≤0.01	
M5	Refractive index repeatability	≤0.01	
M6	Film Stress	≤-100MPa	
M7	BHF etch rate (10:1)	≤50nm/min	

SiN_x deposition	Process conditions
Deposition rate	≥8nm/min
Deposition temperature	150°C

Criteria	SiN_x deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M8	Within wafer uniformity ⁽¹⁾	≤3%	

M9	Wafer to wafer uniformity ⁽²⁾	≤3%	
M10	Refractive index @ 632.8nm	2.0	
M11	Refractive index uniformity	≤0.01	
M12	Refractive index repeatability	≤0.01	
M13	Film Stress	≤300MPa	
M14	BHF etch rate (10:1)	≤20nm/min	

Amorphous Silicon deposition	Process conditions
Deposition rate	≥5nm/min
Deposition temperature	250°C

Criteria	Amorphous Silicon deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M15	Within wafer uniformity ⁽¹⁾	≤3%	
M16	Wafer to wafer uniformity ⁽²⁾	≤4%	
M17	Refractive index @ 632.8nm	3.8	
M18	Refractive index uniformity	≤3%	
M19	Refractive index repeatability	≤3%	
M20	Film Stress	≤ -300MPa	

Tool #1 Chamber #2 must perform to the following specifications:

Etch of GaAs	Process conditions
Etch rate	≥500nm/min
Etch Depth	≤10um
Etch feature size	≥10um

Criteria	Etch of GaAs specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M21	Within wafer uniformity ⁽¹⁾	≤ 5%	
M22	Wafer to wafer uniformity ⁽²⁾	≤ 3%	
M23	Selectivity to SiO ₂	≥15:1	
M24	Profile	90 +/- 2 degrees	

Etch of InP	Process conditions
Etch rate	≥500nm/min
Etch Depth	≤10um
Etch feature size	≥10um

Criteria	Etch of InP specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M25	Within wafer uniformity ⁽¹⁾	≤ 5%	
M26	Wafer to wafer uniformity ⁽²⁾	≤ 3%	
M27	Selectivity to SiO ₂	≥15:1	
M28	Profile	90 +/- 2 degrees	

Atomic layer etch of silicon	Process conditions
Etch rate	2-10A/cycle
Etch Depth	≤100nm
Etch feature size	1-10um

Criteria	Atomic layer etch of silicon specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M29	Within wafer uniformity ⁽¹⁾	≤ 5%	
M30	Wafer to wafer uniformity ⁽²⁾	≤ 5%	
M31	Selectivity to SiO ₂	≥10:1	
M32	Profile	≥80 degrees	

Tool #2 must perform to the following specifications:

SiO ₂ deposition	Process conditions
Deposition rate	≥40nm/min
Deposition temperature	350- 650°C

Criteria	SiO ₂ deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M33	Within wafer uniformity ⁽¹⁾	≤2%	
M34	Wafer to wafer uniformity ⁽²⁾	≤3%	
M35	Refractive index @ 632.8nm	1.46	
M36	Refractive index uniformity	≤0.01	
M37	Refractive index repeatability	≤0.01	
M37	Film Stress	≤300MPa at RI1.46	
M38	BHF etch rate (10:1)	≤250nm/min	

SiN _x deposition	Process conditions
Deposition rate	≥10nm/min
Deposition temperature	350 - 650°C

Criteria	SiN _x deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M39	Within wafer uniformity ⁽¹⁾	≤2%	
M40	Wafer to wafer uniformity ⁽²⁾	≤3%	
M41	Refractive index @ 632.8nm	2.0	
M42	Refractive index uniformity	≤0.01	
M43	Refractive index repeatability	≤0.01	
M44	Film Stress	≤300MPa (high Rf) ≤50MPa (Dual Rf)	
M45	BHF etch rate (10:1)	≤5nm/min	

Tool #3 must perform to the following specifications:

SiO ₂ deposition	Process conditions
Deposition rate	≥40nm/min
Deposition temperature	300°C

Criteria	SiO ₂ deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M46	Within wafer uniformity ⁽¹⁾	≤2%	
M47	Wafer to wafer uniformity ⁽²⁾	≤3%	
M48	Refractive index @ 632.8nm	1.46	
M49	Refractive index uniformity	≤0.01	
M50	Refractive index repeatability	≤0.01	
M51	Film Stress	≤-300MPa at RI1.46	
M52	BHF etch rate (10:1)	≤250nm/min	

SiN _x deposition	Process conditions
Deposition rate	≥10nm/min
Deposition temperature	350 - 650°C

Criteria	SiN _x deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M52	Within wafer uniformity ⁽¹⁾	≤2%	
M53	Wafer to wafer uniformity ⁽²⁾	≤3%	
M54	Refractive index @ 632.8nm	2.0	
M55	Refractive index uniformity	≤0.01	
M56	Refractive index repeatability	≤0.01	
M57	Film Stress	≤300MPa (high Rf) ≤50MPa (Dual Rf)	
M58	BHF etch rate (10:1)	≤5nm/min	

Amorphous Silicon deposition	Process conditions
Deposition rate	≥15nm/min
Deposition temperature	250°C

Criteria	Amorphous Silicon deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M59	Within wafer uniformity ⁽¹⁾	≤4%	
M60	Wafer to wafer uniformity ⁽²⁾	≤2%	
M61	Film Stress	≤-200MPa	

Silicon Carbide deposition	Process conditions
Deposition rate	≥15nm/min
Deposition temperature	250°C

Criteria	Silicon Carbide deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M62	Within wafer uniformity ⁽¹⁾	≤4%	
M63	Wafer to wafer uniformity ⁽²⁾	≤2%	
M64	Film Stress	≤-200MPa	

Tool #4 must perform to the following specifications:

Bosch™ Etch of Silicon	Process conditions
Etch rate	≥18um/min
Etch Depth	150um
Etch feature size	50um
Exposed area	<5%
Aspect ratio	3

Criteria	Bosch™ Etch of Silicon specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M65	Within wafer uniformity ⁽¹⁾	≤2%	
M66	Wafer to wafer uniformity ⁽²⁾	≤3%	
M67	Selectivity to PR	≥300:1	
M68	Selectivity to SiO ₂	≥400:1	
M69	Profile	90.5 +/- 0.5 degree	
M70	Scalloping (peak to peak)	≤20nm	
M71	Notching	≤30nm	

Cryogenic Etch of Silicon	Process conditions
Etch rate	≥2um/min
Etch Depth	25um
Etch feature size	10um
Exposed area	<10%
Aspect ratio	2.5

Criteria	Cryogenic Etch of Silicon specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M72	Within wafer uniformity ⁽¹⁾	≤4%	
M73	Wafer to wafer uniformity ⁽²⁾	≤3%	
M74	Selectivity to PR	≥100:1	
M75	Selectivity to SiO ₂	≥150:1	
M76	Profile	90.5 +/- 1 degree	
M77	Sidewall roughness	≤5nm	

Tool #5 must perform to the following specifications:

Etch of SiO ₂	Process conditions
Etch rate	≥200nm/min
Etch Depth	<2um
Etch feature size	≥10um

Criteria	Etch of Silicon specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M78	Within wafer uniformity ⁽¹⁾	≤5%	
M79	Wafer to wafer uniformity ⁽²⁾	≤3%	
M80	Selectivity to PR	≥3:1	
M81	Profile	≥85 degrees	

Etch of GaAs	Process conditions
Etch rate	≥500nm/min
Etch Depth	<10um
Etch feature size	≥10um

Criteria	Etch of GaAs specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M82	Within wafer uniformity ⁽¹⁾	≤5%	
M83	Wafer to wafer uniformity ⁽²⁾	≤3%	
M84	Selectivity to SiO ₂	≥15:1	
M85	Profile	90 +/- 2 degree	

Etch of InP	Process conditions
Etch rate	≥500nm/min
Etch Depth	<10um
Etch feature size	≥10um

Criteria	Etch of InP specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M86	Within wafer uniformity ⁽¹⁾	≤5%	

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M87	Wafer to wafer uniformity ⁽²⁾	≤3%	
M88	Selectivity to SiO ₂	≥15:1	
M89	Profile	90 +/- 2 degree	

Tool #6 must perform to the following specifications:

Plasma SiO ₂ deposition	Process conditions
Deposition rate	≥1.2A/cycle at 300°C
Deposition temperature	300°C

Criteria	SiO ₂ deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M90	Within wafer uniformity ⁽¹⁾	≤2%	
M91	Wafer to wafer uniformity ⁽²⁾	≤2%	
M92	Refractive index @ 632.8nm	1.45@300°C	
M93	Refractive index uniformity	≤0.01	
M94	Refractive index repeatability	≤0.01	
M95	Film Stress	≤-300MPa @ RI 1.45	
M96	BHF etch rate (10:1)	≤250nm/min	

Plasma Al ₂ O ₃ deposition	Process conditions
Deposition rate	≥1.2A/cycle at 200°C
Deposition temperature	200°C

Criteria	Plasma Al ₂ O ₃ deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M97	Within wafer uniformity ⁽¹⁾	≤1%	
M98	Wafer to wafer uniformity ⁽²⁾	≤2%	
M99	Refractive index @ 632.8nm	1.64@200°C	
M100	Refractive index uniformity	≤0.01	
M101	Refractive index repeatability	≤0.01	

Thermal Al ₂ O ₃ deposition	Process conditions
Deposition rate	≥0.95A/cycle at 200°C
Deposition temperature	200°C

Criteria	Thermal Al ₂ O ₃ deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M102	Within wafer uniformity ⁽¹⁾	≤1%	
M103	Wafer to wafer uniformity ⁽²⁾	≤2%	
M104	Refractive index @ 632.8nm	1.62@200°C	
M105	Refractive index uniformity	≤0.01	
M106	Refractive index repeatability	≤0.01	

Plasma HfO ₃ deposition	Process conditions
Deposition rate	1.2A/cycle at 200°C
Deposition temperature	150-200°C

Criteria	Plasma HfO ₃ deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M107	Within wafer uniformity ⁽¹⁾	≤3%	
M108	Wafer to wafer uniformity ⁽²⁾	≤3%	
M109	Refractive index @ 632.8nm	2 +/- .1	
M110	Density	≥9gm/cm ³	
M111	Stress	Tunable +/- 3000MPa	
	Roughness	≤2nm	

Thermal HfO ₃ deposition	Process conditions
Deposition rate	0.9A/cycle at 200°C
Deposition temperature	150-200°C

Criteria	Plasma HfO ₃ deposition specification	Mandatory Requirements	Bidder's specifications (The bidder should indicate the reference to the technical documents included in the bid)
M112	Within wafer uniformity ⁽¹⁾	≤4%	
M113	Wafer to wafer uniformity ⁽²⁾	≤4%	
M114	Refractive index @ 632.8nm	2 +/- .1	
M115	Density	≥9gm/cm ³	
M116	Stress	Tunable +/- 3000MPa	
M117	Roughness	≤2nm	

ATTACHMENT 2
Point Rated Criteria

If multiple bids are received, all bidders that pass the mandatory technical criteria will be requested to process wafer samples to validate performance claims of compliance. NRC reserves the right to be present for all or part of the processing of these tests (at NRC's expense). This Data Validation Test is to confirm that the bidder is able to address some aspect of the Requirement.

Data Validation Tests must be processed at the bidder's facility using the suite of tools proposed by the bidder and must be completed within 90 days of receipt of the 75mm wafers from the NRC. After the samples have been processed, the bidder must ship the samples and the results using the Data Collection document provided by the Contracting Authority. Canada will review the test results to ensure the demonstrated performance has been accurately documented. Should it be necessary, NRC will contact the Bidder to discuss the test results. Samples will be scored against the 20 criteria as outlined below and allocated the appropriate points to a maximum of 54.

Bidders are responsible to furnish all test equipment required for testing at their own costs.

Wafer Characteristics for Data Validation Tests

- I. All deposition demonstrations will be on 100mm Silicon wafers supplied by the Bidder.
- II. All dielectric and silicon etch demonstrations will be on 75mm wafers supplied by NRC.
- III. All III/V etch demonstrations will be on 75mm wafers supplied by NRC.

Uniformity data analysis will use a 5mm edge exclusion and 9 points;
Run size for repeatability data analysis will be a minimum of 6 wafers;

Note: Definitions of formula used:

- (1) Within Wafer Uniformity = $(\text{Max}-\text{Min}) / (2 * \text{Average}) (\%)$
- (2) Wafer to wafer uniformity (Repeatability) = $(\text{Max}-\text{Min}) / (2 * \text{Average}) (\%)$

Tool#1: Chamber #1 Inductively Coupled Plasma Chemical Deposition (IPCVD)

SiO₂ deposition specification

<u>Rated No</u>	<u>Description</u>	<u>Mandatory Requirements</u>	<u>Point Rated Criterion</u> Points will be awarded based on the thresholds below and rounded up to the nearest decimal point:
R1	Within wafer uniformity ⁽¹⁾	≤2%	1.8% - 1.5% 1pt 1.4% - 1.1% 2pts 1.0% - 0.8% 3pts
R2	Wafer to wafer uniformity ⁽²⁾	≤3%	2.6% - 2.1% 1pt 2.0% - 1.5% 2pts 1.4% - 0.9% 3pts
R3	Refractive index uniformity	≤0.01	≤ 0.005 2pts
R4	Refractive index repeatability	≤0.01	≤ 0.005 2pts

MAXIMUM POINTS: 10

Tool #1: Chamber #2 Inductively Coupled Plasma Etch and Atomic layer etching

ALE Etch of Silicon

<u>Rated No</u>	<u>Description</u>	<u>Mandatory Requirements</u>	<u>Point Rated Criterion</u> Points will be awarded based on the thresholds below and rounded up to the nearest decimal point:
R5	Within wafer uniformity ⁽¹⁾	≤ 5%	4.6% - 4.1% 1pt 4.0% - 3.5% 2pt 3.4% - 2.9% 3pt
R6	Wafer to wafer uniformity ⁽²⁾	≤ 5%	4.6% - 4.1% 1pt 4.0% - 3.5% 2pt 3.4% - 2.9% 3pt

MAXIMUM POINTS: 6

Tool #2 Plasma Enhanced Chemical Vapor Deposition (PECVD) Dielectric films

SiN_x deposition specification

<u>Rated No</u>	<u>Description</u>	<u>Mandatory Requirements</u>	<u>Point Rated Criterion</u> Points will be awarded based on the thresholds below and rounded up to the nearest decimal point:
R7	Within wafer uniformity ⁽¹⁾	≤2%	1.8% - 1.5% 1pt 1.4% - 1.1% 2pt 1.0% - 0.8% 3pt
R8	Wafer to wafer uniformity ⁽²⁾	≤3%	2.6% - 2.1% 1pt 2.0% - 1.5% 2pt 1.4% - 0.9% 3pt
R9	Refractive index uniformity	≤0.01	≤0.005 2pt
R10	Refractive index repeatability	≤0.01	≤0.005 2pt

MAXIMUM POINTS: 10

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Tool #3 Plasma Enhanced Chemical Vapor Deposition (PECVD) Amorphous Silicon**SiO₂ deposition specification**

<u>Rated No</u>	<u>Description</u>	<u>Mandatory Requirements</u>	<u>Point Rated Criterion</u> Points will be awarded based on the thresholds below and rounded up to the nearest decimal point:
R11	Within wafer uniformity ⁽¹⁾	≤2%	1.8% - 1.5% 1pt 1.4% - 1.1% 2pt 1.0% - 0.8% 3pt
R12	Wafer to wafer uniformity ⁽²⁾	≤3%	2.6% - 2.1% 1pt 2.0% - 1.5% 2pt 1.4% - 0.9% 3pt
R13	Refractive index uniformity	≤0.01	≤0.005 2pt
R14	Refractive index repeatability	≤0.01	≤0.005 2pt

MAXIMUM POINTS: 10

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Tool #4 Inductively Coupled Plasma Etch (ICP) of Silicon using Bosch™ and Cryogenic etching

Bosch™ Etch of Silicon

<u>Rated No</u>	<u>Description</u>	<u>Mandatory Requirements</u>	<u>Point Rated Criterion</u> Points will be awarded based on the thresholds below and rounded up to the nearest decimal point:
R15	Within wafer uniformity ⁽¹⁾	<2%	1.8% - 1.5% 1pt 1.4% - 1.1% 2pt 1.0% - 0.8% 3pt
R16	Wafer to wafer uniformity ⁽²⁾	<3%	2.6% - 2.1% 1pt 2.0% - 1.5% 2pt 1.4% - 0.9% 3pt

MAXIMUM POINTS: 6

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Tool #5 Inductively Coupled Plasma Etch (ICP)

Etch of InP

<u>Rated No</u>	<u>Description</u>	<u>Mandatory Requirements</u>	<u>Point Rated Criterion</u> Points will be awarded based on the thresholds below and rounded up to the nearest decimal point:
R17	Within wafer uniformity ⁽¹⁾	<5%	4.6% - 4.1% 1pt 4.0% - 3.5% 2pt 3.4% - 2.9% 3pt
R18	Wafer to wafer uniformity ⁽²⁾	<3%	2.6% - 2.1% 1pt 2.0% - 1.5% 2pt 1.4% - 0.9% 3pt

MAXIMUM POINTS: 6

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Tool #6 Atomic Layer Deposition (ALD)

Plasma HfO₃ deposition specification

<u>Rated No</u>	<u>Description</u>	<u>Mandatory Requirements</u>	<u>Point Rated Criterion</u> Points will be awarded based on the thresholds below and rounded up to the nearest decimal point:
R19	Within wafer uniformity ⁽¹⁾	≤3%	2.6% - 2.1% 1pt 2.0% - 1.5% 2pt 1.4% - 0.9% 3pt
R20	Wafer to wafer uniformity ⁽²⁾	≤3%	2.6% - 2.1% 1pt 2.0% - 1.5% 2pt 1.4% - 0.9% 3pt

MAXIMUM POINTS: 6

ANNEX B

BASIS OF PAYMENT

The Bidder must provide all of the pricing requested in the following Tables in accordance with **Article 6.6.1 - Basis of Payment.**

Table 1: Requirement:

Item	Description	Number of Units	Unit of Issue	Firm Price Per Unit	Extended Price
1	Configuration and Installation Plan	1	Lot	\$	\$
2	Tool #1 Inductively Coupled Plasma Chemical Deposition and Inductively Coupled Plasma Etch Cluster tool; 1.1 Chamber #1 - Inductively Coupled Plasma Chemical Deposition. 1.2 Chamber #2 - Inductively Coupled Plasma Etch and Atomic layer etching. Delivery at Place; Installation; Documentation; Training; and Warranty, Maintenance and Support Services	1	Lot	\$	\$
3	Tool #2 Plasma Enhanced Chemical Vapor Deposition (PECVD) Dielectric films; Delivery at Place; Installation; Documentation; Training; and Warranty, Maintenance and Support Services	1	Lot	\$	\$
4	Tool #3 Plasma Enhanced Chemical Vapor Deposition (PECVD) Amorphous Silicon; Delivery at Place; Installation; Documentation; Training; and Warranty, Maintenance and Support Services	1	Lot	\$	\$
5	Tool #4 Inductively Coupled Plasma Etch (ICP) of Silicon using Boschtm and Cryogenic etching; Delivery at Place; Installation; Documentation; Training; and Warranty, Maintenance and Support Services	1	Lot	\$	\$
6	Tool #5 Inductively Coupled Plasma Etch (ICP) of III/V compound semiconductors and dielectrics using Halide and Fluoride chemistries; Delivery at Place; Installation; Documentation; Training; and Warranty, Maintenance and Support Services	1	Lot	\$	\$

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7	Tool #6 Atomic Layer Deposition (ALD) of HfO2, Al2O3 and SiO2; Delivery at Place; Installation; Documentation; Training; and Warranty, Maintenance and Support Services	1	Lot	\$	\$
Total Evaluated Price (Please identify currency)					Sum of Items 1 through 7

Table 2 – Optional Requirement

Item	Description	Number of Units	Unit of Issue	Evaluated Price - Firm Annual All-inclusive Lot Price Please identify currency
1	Extended Warranty, Maintenance and Support Services for one year for Tools 1-6, as described in Annex A.	1	Lot	\$

Table 3: Total Aggregated Bid Price:

Item	Description	Evaluated Price
1	Table 1: Initial Requirement	As per Evaluated Price from Table 1
2	Table 2: Optional Requirement	As per Evaluated Price from Table 2
3	Total Aggregated Bid Price	Sum of Tables 1 and 2

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ANNEX C
LIST OF PRODUCTS

Product Name	Model/Part Number	Name of Manufacture

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ATTACHMENT 3

ELECTRONIC PAYMENT INSTRUMENTS

The Bidder accepts any of the following Electronic Payment Instrument(s):

- ☐ VISA Acquisition Card;
- ☐ MasterCard Acquisition Card;
- ☐ Direct Deposit (Domestic and International);
- ☐ Electronic Data Interchange (EDI);
- ☐ Wire Transfer (International Only);

ATTACHMENT 4

COMPLETE LIST OF DIRECTORS

(As per Standard Instructions, Clauses and Conditions Part 2)

Name	Position
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>

ATTACHMENT 5

FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - CERTIFICATION

I, the Bidder, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada will declare a bid non-responsive, or will declare a contractor in default, if a certification is found to be untrue, whether during the bid evaluation period or during the contract period. Canada will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with any request or requirement imposed by Canada may render the bid non-responsive or constitute a default under the Contract.

For further information on the Federal Contractors Program for Employment Equity visit [Employment and Social Development Canada \(ESDC\)-Labour's](#) website.

Date: _____ (YYYY/MM/DD) (If left blank, the date will be deemed to be the bid solicitation closing date.)

Complete both A and B.

A. Check only one of the following:

- ☐ A1. The Bidder certifies having no work force in Canada.
- ☐ A2. The Bidder certifies being a public sector employer.
- ☐ A3. The Bidder certifies being a [federally regulated employer](#) being subject to the [Employment Equity Act](#).
- ☐ A4. The Bidder certifies having a combined work force in Canada of less than 100 permanent full-time and/or permanent part-time employees.

A5. The Bidder has a combined workforce in Canada of 100 or more employees; and

- ☐ A5.1. The Bidder certifies already having a valid and current [Agreement to Implement Employment Equity](#) (AIEE) in place with ESDC-Labour.

OR

- ☐ A5.2. The Bidder certifies having submitted the [Agreement to Implement Employment Equity](#) (LAB1168) to ESDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to ESDC-Labour.

B. Check only one of the following:

- ☐ B1. The Bidder is not a Joint Venture.

OR

- ☐ B2. The Bidder is a Joint Venture and each member of the Joint Venture must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the Standard Instructions)

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ATTACHMENT 6

OEM Certification

OEM Certification Form	
This confirms that the original equipment manufacturer (OEM) identified below has authorized the Bidder named below to provide and maintain its products under any contract resulting from the bid solicitation identified below.	
Name of OEM	_____
Signature of authorized signatory of OEM	_____
Print Name of authorized signatory of OEM	_____
Print Title of authorized signatory of OEM	_____
Address for authorized signatory of OEM	_____
Telephone no. for authorized signatory of OEM	_____
Fax no. for authorized signatory of OEM	_____
Date signed	_____
Solicitation Number	_____
Name of Bidder	_____