



**RETURN BIDS TO:**

**RETOURNER LES SOUMISSIONS À:**

Réception des soumissions - TPSGC / Bid Receiving  
- PWGSC

1550, Avenue d'Estimauville  
1550, D'Estimauville Avenue  
Québec  
Québec  
G1J 0C7

FAX pour soumissions: (418) 648-2209

**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**

<b>Title - Sujet</b> High Temperature Vacuum Furnace	
<b>Solicitation No. - N° de l'invitation</b> 31206-208816/A	<b>Date</b> 2019-07-31
<b>Client Reference No. - N° de référence du client</b> 31206-208816	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$QCN-037-17736	
<b>File No. - N° de dossier</b> QCN-9-42088 (037)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2019-09-13</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Heure Avancée de l'Est HAE
<b>F.O.B. - F.A.B.</b> Specified Herein - Précisé dans les présentes <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input type="checkbox"/> <b>Other-Autre:</b> <input checked="" type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Roy, Alain	<b>Buyer Id - Id de l'acheteur</b> qcn037
<b>Telephone No. - N° de téléphone</b> (418) 649-2845 ( )	<b>FAX No. - N° de FAX</b> (418) 648-2209
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> CONSEIL NATIONAL DE RECHERCHES DU CANADA 435 ELLICE AVENUE WINNIPEG MANITOBA R3B1Y6 Canada	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

**Vendor/Firm Name and Address**

**Raison sociale et adresse du  
fournisseur/de l'entrepreneur**

**Issuing Office - Bureau de distribution**

TPSGC/PWGSC  
601-1550, Avenue d'Estimauville  
Québec  
Québec  
G1J 0C7

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

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## **PART 1 - GENERAL INFORMATION**

### **1.1 Security Requirements**

There is no security requirements.

### **1.2 Requirement**

The requirement is detailed at Annex A.

### **1.3 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.

### **1.4 Trade Agreements**

The requirement is subject to the provisions of the World Trade Organization Agreement on Government Procurement (WTO-AGP), the North American Free Trade Agreement (NAFTA), the Canada-European Union Comprehensive Economic and Trade Agreement (CETA), and the Canadian Free Trade Agreement (CFTA).

### **1.5 epost Connect service**

This bid solicitation allows bidders to use the epost 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.

## **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) (<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](#) (2019-03-04) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

#### **2.1.1 SACC Manual Clauses**

B1000T (2014-06-26) Condition of material – Bid

### **2.2 Submission of Bids**

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

**2.2.1** By using the [epost Connect service provided by Canada Post Corporation](https://www.canadapost.ca/web/en/products/details.page?article=epost_connect_send_a) ([https://www.canadapost.ca/web/en/products/details.page?article=epost\\_connect\\_send\\_a](https://www.canadapost.ca/web/en/products/details.page?article=epost_connect_send_a))  
The email address of PWGSC Quebec region Bid Receiving Unit is:  
[TPSGC.RQReceptionSoumissions-QRSupplyTendersReception.PWGSC@tpsgc-pwgsc.gc.ca](mailto:TPSGC.RQReceptionSoumissions-QRSupplyTendersReception.PWGSC@tpsgc-pwgsc.gc.ca)

**Note: Bids will not be accepted if emailed directly to this email address. This email address is to be used to open an epost Connect conversation, as detailed in Standard Instructions 2003, or to send bids through an epost Connect message if the bidder is using its own licensing agreement for epost Connect.**

**2.2.2** Tenders can also be transmitted by fax to **418-648-2209**

**2.2.3** By mail or in person at:  
Public Works and Government Services Canada (PWGSC)  
1550, Avenue of Estimaerville  
Quebec City, Quebec G1J 0C7

### **2.3 Enquiries - Bid Solicitation**

All enquiries must be submitted in writing to the Contracting Authority no later than seven (7) 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

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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 the Province of Quebec.

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.

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## PART 3 - BID PREPARATION INSTRUCTIONS

### 3.1 Bid Preparation Instructions

- If the Bidder chooses to submit its bid electronically, Canada requests that the Bidder submits its bid in accordance with section 08 of the 2003 standard instructions. Bidders must provide their bid in a single transmission. The epost Connect service has the capacity to receive multiple documents, up to 1GB per individual attachment.

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

Section I: Technical Offer  
Section II: Financial Offer  
Section III: Certifications

- If the Bidder chooses to submit its bid in hard copies, Canada requests that the Bidder submits its bid in separately bound sections as follows:

Section I: Technical Offer (Two (2) hard copies)  
Section II: Financial Offer (One (1) hard copy)  
Section III: Certifications (One (1) hard copy)

If there is a discrepancy between the wording of the soft copy on electronic media and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.

- 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 epost Connect service, the wording of the electronic copy provided through epost Connect service will have priority over the wording of the other copies.

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

Canada requests that bidders follow the format instructions described below in the preparation of hard copy of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the RFSO.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) (<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>). To assist Canada in reaching its objectives, Offerors should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

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**Section I: Technical Bid**

In their technical bid, Bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

**Section II: Financial Bid**

Bidders must submit their financial bid in accordance with the Basis of Payment – Annex C. The total amount of Applicable Taxes must be shown separately.

**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.

#### **4.1.1 Technical Evaluation**

Each bid will be reviewed to determine whether it meets the mandatory requirements of the bid solicitation. Any element of the bid solicitation identified with the words "must" or "mandatory" is a mandatory requirement.

Bids that do not comply with each and every mandatory requirement will be declared non-responsive and be disqualified.

##### **4.1.1.1 Mandatory Technical Criteria**

**The bidder must include with its proposal:**

##### **1. The Table of technical compliance below duty filled-in:**

The supplied equipment must meet or better all of the requirements defined below. The supplied equipment is to be new, not used or refurbished. Equipment not meeting all the following Mandatory Requirements will be considered non-responsive.

Bidder must provide with their proposal technical literature/brochures, operating manuals, written documentation (such as a description of equipment components and capabilities) etc., to demonstrate compliance with each area of the criteria stated below at time of bid closing. Proposal evaluation will be based upon the information supplied with the bid only. Failure to demonstrate compliance with any area of the criteria will render your proposal non-responsive and no further consideration will be given. References are to be specific to supporting documentation (ex. document title, page and paragraph number).

Please note that compliance must be demonstrated (by submission of supporting documentation such as technical literature/brochures, operating manuals, written statement describing how requirement is met etc.) and that if an offeror only states "comply" without any further detail, this is not considered as a demonstration compliance. A full description of the performance and capabilities of the equipment must be provided.

Although bidders must propose products meeting all mandatory specifications and components outlined in **Annexes "A"**, at the bid closing date, bids will be evaluated on following preselected mandatory specifications and components:

**(See Table on next page)**

<b>TABLE OF TECHNICAL COMPLIANCE</b>		
<b>Mandatory Technical Specifications :</b>		<b>Bidder's Specifications</b> (should indicate the reference to the technical documentation of the proposed equipment or indicate the exact information)
		<b>References</b>
<b>Furnace chamber :</b>		
1.	Fully made of metal (no ceramic thermal insulation accepted).	_____ _____
<b>Hot Zone:</b>		
2.	Insulation provided by metal shields: inner layer made of lanthanated molybdenum.	_____ _____
<b>Metallic Retort:</b>		
3.	Usable volume: minimum 27 liters.	_____ _____
<b>Dual vacuum capacity: mechanical (dry jump) high vacuum (diffusion pump)</b>		
4.	Mechanical (dry jump): Capacity 50ft <sup>3</sup> / min (1,415 liter/min).	_____ _____
5.	Achievable Vacuum with Dry pump: 10 <sup>-2</sup> mBar.	_____ _____
6.	Partial pressure controlled between 10 and 1000 mBar.	_____ _____
7.	Achievable Vacuum with Diffusion pump: 10 <sup>-5</sup> to 10 <sup>-6</sup> mBar.	_____ _____
<b>Working Temperature:</b>		
8.	1600 °C under vacuum. 1500 °C at 800 mbar of N2 and/or Argon. 1400 °C at 800 mbar of H2.	_____ _____

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<b>Process Gas:</b>	
<b>9.</b>	N2, Ar, Repurified Ar and H2.  <hr/> <hr/>
<b>Safety Regulations:</b>	
<b>10.</b>	Constructed per NFPA and OSHA regulations.  <hr/> <hr/>

#### 4.1.2 Evaluation of Price

1. Bidders must submit firm prices, customs duties and excise taxes included, and Applicable Taxes excluded.
2. Unless the bid solicitation specifically requires bids to be submitted in Canadian currency, bids 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 bid solicitation closing date, or on another date specified in the bid solicitation, will be applied as a conversion factor to the bids submitted in foreign currency.
3. Bidders must provide prices Delivered Duty Paid (DDP) National Research Council Canada, 435 Ellice Avenue, Winnipeg, MB, R3B 1Y6, Canada, Incoterms 2010 for shipments from commercial contractor.

#### 4.2 Basis of Selection

A bid must comply with the requirements of the bid solicitation and all the mandatory technical criteria to be declared responsive. The responsive bid with the lowest Total Bid Price (TBP) (Annex B) will be recommended for award of a contract.

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## 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 [Ineligibility and Suspension Policy \(http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html\)](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Bidder must provide with its bid the required documentation, as applicable, 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 [Ineligibility and Suspension Policy \(http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html\)](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](http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969)" list available at the bottom of the page of the [Employment and Social Development Canada \(ESDC\) - Labour's website \(http://www.esdc.gc.ca/en/jobs/workplace/human\\_rights/employment\\_equity/federal\\_contractor\\_program.page?&\\_ga=1.229006812.1158694905.1413548969\)](http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969).

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](http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969)" list at the time of contract award.

### 5.2.3 Additional Certifications Required with the Bid

#### 5.2.3.1 Bidder certifies that All Equipment is “Off-the-Shelf”

Any equipment bid to meet this requirement must be “off-the-shelf” (unless otherwise stated in this bid solicitation), meaning that each item of equipment is commercially available and requires no further research or development and is part of an existing product line with a field-proven operational history (that is, it has not simply been tested in a laboratory or experimental environment). If any of the equipment bid is a fully compatible extension of a field-proven product line, it must have been publicly announced on or before the bid closing date. By submitting a bid, the Bidder is certifying that the entire equipment bid is off-the-shelf.

#### 5.2.3.2 OEM Certification (Annex C)

- (a) Any Bidder that is not the Original Equipment Manufacturer (OEM) for every item of hardware 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, which must be signed by the OEM (not the Bidder). **(Annex C)**

No Contract will be awarded to a Bidder who is not the OEM of the hardware 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. 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.

- (b) If the hardware proposed by the Bidder originates with multiple OEMs, a separate OEM certification is required from each OEM.
- (c) For the purposes of this bid solicitation, EOM means the manufacturer of the hardware, as evidenced by the name appearing on the hardware 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 requirements

### 6.2 Requirement

The Contractor must provide and deliver to the Canadian Coast Guard, the equipment, in accordance with the Requirement at Annex "A".

### 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 (2018-06-21), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

#### 6.3.2 Supplemental General Conditions

4001 (2015-04-01) Hardware Purchase, Lease and Maintenance, apply to and form part of the Contract.

### 6.4 Term of Contract

#### 6.4.1 Period of the Contract

The contract period is from the date of contract award **until 1 year after the acceptance of the deliverables.**

#### 6.4.2 Delivery Delay

All deliverables must be received no later than twenty one (21) weeks after contract award.

### 6.5 Authorities

#### 6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Alain Roy  
Title: Supply Specialist  
Public Works and Government Services Canada

Telephone: 418-649-2845  
Facsimile: 418-648-2209  
E-mail address: [Alain.Roy.que@pwgsc.gc.ca](mailto:Alain.Roy.que@pwgsc.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.

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### 6.5.2 Technical Authority

The Technical Authority for the Contract is: [\(Will be added at Contract Award\)](#)

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_  
  
Telephone: \_\_\_\_-\_\_\_\_-\_\_\_\_\_  
E-mail address: \_\_\_\_\_

The Technical Authority 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 Client Administrative Authority

The Client Administrative Authority for the Contract is: [\(Will be added at Contract Award\)](#)

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_  
  
Telephone: \_\_\_\_-\_\_\_\_-\_\_\_\_\_  
Facsimile: \_\_\_\_-\_\_\_\_-\_\_\_\_\_  
E-mail address: \_\_\_\_\_

### 6.5.4 Contractor's Representative

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_  
  
Telephone: \_\_\_\_-\_\_\_\_-\_\_\_\_\_  
Facsimile: \_\_\_\_-\_\_\_\_-\_\_\_\_\_  
E-mail address: \_\_\_\_\_

## 6.6 Payment

### 6.6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price, as specified in Annex C for a cost of \$ \_\_\_\_\_ [\(insert the amount at contract award\)](#). 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.

### 6.6.2 Limitation of Price

SACC Manual Clause C6000C, (2017-08-17) Limitation of Price

### 6.6.3 Terms of payment

SACC Manual Clause H1000C, (2008-05-12) Single payment

## 6.7 Invoicing Instructions

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.
2. Invoices must be distributed as follows:
  - a. The original must be forwarded to the Client Administrative Authority for certification and payment.
  - b. One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

## 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.

## 6.9 Applicable Laws

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

## 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 4001 (2015-04-01) Hardware Purchase, Lease and Maintenance;
- c) the General Conditions 2010A (2018-06-21) Goods (Medium Complexity);
- d) Annex A, Requirement;
- e) Annex B, Basis of payment;
- f) Annex C, OEM Certification Form;
- g) the Contractor's bid dated \_\_\_\_\_ (*insert date of bid*)

## 6.11 SACC Manual Clauses

G1005C	2016-01-28	Insurance
B1501C	2007-11-30	Electrical Equipment
B7500C	2006-06-16	Excess Goods
D9002C	2007-11-30	Incomplete Assemblies

## 6.12 Shipping Instructions - Delivery at Destination

Goods must be consigned to the destination specified in the Contract and delivered DDP Delivered Duty Paid; National Research Council Canada, 435 Ellice Avenue, Winnipeg, MB, R3B 1Y6, Canada, Incoterms 2010 for shipments from commercial contractor.

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**ANNEX A: STATEMENT OF REQUIREMENTS**  
**HIGH TEMPERATURE VACUUM / PARTIAL PRESSURE FURNACE (MIM)**  
**FOR SECOND STAGE DEBINDING AND SINTERING**

**1 Object**

- 1.1** The National Research Council Canada (NRC) wishes to purchase a High Temperature Vacuum/ Partial Pressure Furnace (MIM) for Second Stage Debinding and Sintering. NRC want to diversify its activities in additive manufacturing to fulfill a need of cars industry in advanced conception.

The work consists of supply, delivery, installation of the system at the NRC, Winnipeg Site address mentioned at the section 6.

**2 Constraints**

W/O

**3 Mandatory technical specifications**

Delivered equipment must have the following specifications:

- 3.1 Furnace chamber**  
3.1.1 Fully made of metal (no ceramic thermal insulation accepted)
- 3.2 Hot zone**  
3.2.1 Insulation provided by metal shields: inner layer made of lanthanated molybdenum
- 3.3 Metallic retort**  
3.3.1 Usable volume: minimum 27 liters
- 3.4 Dual vacuum capacity: mechanical (dry jump) high vacuum (diffusion pump)**  
3.4.1 Mechanical (dry jump): Capacity 50ft<sup>3</sup> / min (1 415 liter/min)  
3.4.2 Achievable Vacuum with Dry pump: 10<sup>-2</sup> mBar  
3.4.3 Partial pressure controlled between 10 and 1000 mBar  
3.4.4 Achievable Vacuum with Diffusion pump: 10<sup>-5</sup> to 10<sup>-6</sup> mBar
- 3.5 Working temperature**  
3.5.1 1600 °C under vacuum  
3.5.2 1500 °C at 800 mbar of N<sub>2</sub> and/or Argon  
3.5.3 1400 °C at 800 mbar of H<sub>2</sub>
- 3.6 Process gas**  
3.6.1 N<sub>2</sub>  
3.6.2 Ar  
3.6.3 Repurified Ar  
3.6.4 H<sub>2</sub>
- 3.7 Safety item:**  
3.7.1 Constructed per NFPA and OSHA regulations

#### **4 Operational technical specification**

- 4.1 Must have a Direct Plant/Corporate Ethernet Port access to controller to function as SCADA bus**
- 4.2 Must be capable of:**
  - Two (2) way communication of internal memory tags, process variables and sensor data to a supervisory control and Data acquisition system (SCADA) via :**
    - 4.2.1 OPC UA
    - 4.2.2 MQTT or
    - 4.2.3 Web socket
- 4.3 Must have an open access to adding additional tags or process parameters to the SCADA bus**
- 4.4 Must be capable of interacting with an additional external controllers as required through a time-sensitive-networking enabled Ethernet interface for control signals**
- 4.5 Furnace chamber:**
  - 4.5.1 Front and rear doors, must be equipped with pneumatic latch and locks
- 4.6 Metallic retort:**
  - 4.6.1 To receive sixteen (16) shelves
  - 4.6.2 Shelf load capacity: 7.5 lbs (3.4 kg)
  - 4.6.3 Made of Ti-Zr Molybdenum alloy
  - 4.6.4 Uniform gas flow distribution on each shelf
  - 4.6.5 Removable central support to accommodate for larger pieces (300 x 300 x 300) (mm)
- 4.7 Electrical enclosure: to contain all electrical control**
- 4.8 Temperature uniformity in the retort must be:**
  - 4.8.1 Under vacuum  $\pm 5^{\circ}\text{C}$
  - 4.8.2 Under flow condition  $\pm 10^{\circ}\text{C}$
- 4.9 Tightness (leak up rate rise, under high vacuum, all valves closed): 0.007 mBar/hr**
- 4.10 Process gas**
  - 4.10.1 All process gases must be managed by mass flow controllers
  - 4.10.2 Dew Point transducer to measure water content of process gases before entering the furnace chamber

**4.11 Safety item:**

- 4.11.1 Furnace chamber equipped with explosion port
- 4.11.2 Include a system that allows to burn hydrogen as it exits the stack
- 4.11.3 Uninterruptible Power Supply (UPS) with two (2) function
  - 4.11.3.1 15 minutes back up time
  - 4.11.3.2 Keeps furnace running (no heat) during a power glitch of 1 minute

**4.12 System control:**

- 4.12.1 Furnace and subsidiary must be fully computed controlled via a single control software
- 4.12.2 Control software must integrate all possible safety elements
- 4.12.3 Software visualization
  - 4.12.3.1 System status
  - 4.12.3.2 Profile builder
  - 4.12.3.3 Process data view
  - 4.12.3.4 Maintenance activities
  - 4.12.3.5 Alarms

**4.13 The system must have at least two (2) communications ports: USB and Ethernet**

**4.14 The system software shall provide direct access to a controller operating similar to a SCADA port.**

**4.15 Debinding residue management**

- 4.15.1 Automated cleaning function to remove accumulating debinding residue in piping and binder collection system

**4.16 Temperature control, monitoring and survey:**

- 4.16.1 Composed of at least two (2) controlled zones
- 4.16.2 One monitoring TC (Thermocouple) at the center of the retort
- 4.16.3 At least one (1) safety TC to prevent furnace over heating
- 4.16.4 Capable of performing temperature survey with at least nine (9) TC

**4.17 Fast cooling**

- 4.17.1 The system must have a exchanger blower
- 4.17.2 Retort doors to include shutters for fast cooling process

**4.18 Water cooling system:**

- 4.18.1 Water tank to provide adequate cooling for the furnace
- 4.18.2 Including pumps and valves
- 4.18.3 Safety sensors level for:
  - 4.18.3.1 temperature and
  - 4.18.3.2 water
- 4.18.4 Overflow building drain

## **5 Documentation**

### **5.1 Technical documentation:**

- 5.1.1 English and /or French
- 5.1.2 Operation manuals of furnace and subsidiary systems
- 5.1.3 Drawing (paper and electronic format)
  - 5.1.3.1 General furnace layout
  - 5.1.3.2 Hook – Up panel instructions
  - 5.1.3.3 Schematic for
    - 5.1.3.3.1 Electric
    - 5.1.3.3.2 Pneumatic
    - 5.1.3.3.3 Water
    - 5.1.3.3.4 Vacuum
  - 5.1.3.4 Front and side elevation of the hot zone
  - 5.1.3.5 Retort door and shutter mechanism schematic
- 5.1.4 Technical documentation of control instruments
- 5.1.5 All services building floor and foundation requirements
- 5.1.6 Material data safety sheets for all chemical used during normal operation (ex: fluids, chemicals for water tank...)

## **6 Other requirements**

### **6.1 Electrical Power:**

- 6.1.1 The supplier must specify the power consumption of each deliverable (Volts, kVa phases). The equipment must operate on 60Hz (Validate with the building team)

### **6.2 Services**

- 6.2.1 The supplier must provide information on the required services (gas, water, etc.) for the proper operation of the deliverables. It must provide the pressures, flow rates and pipe diameters required to supply the deliverables. Connector types must also be provided

### **6.3 Foundations**

- 6.3.1 The supplier must specify the floor and foundation requirements to support the deliverables (type of concrete, thickness, concrete slab insulated from vibration, etc.)

### **6.4 Ventilation**

- 6.4.1 The supplier must specify the required ventilation to safely use the deliverables. It must specify flow rates, pressures and pipe diameters.

### **6.5 The contractor must offer maintenance, repair and spare parts of control system, and software on emergency between the next 72 hours after the NRC's call.**

### **6.6 Contractor have to provide maintenance service, spare parts and reparation.**

## **7 Deliverables**

### **7.1 Furnace, subsidiary systems and replacement parts:**

- 7.1.1 Main furnace
- 7.1.2 Cooling water system with all required subsidiary systems and accessories
- 7.1.3 Twenty (20) shelves made of lanthanated molybdenum (flappable shelves)
- 7.1.4 Forty (40) Porous ceramic setter plates (> 96% alumina)
- 7.1.5 Twenty-four (24) flexible TC for temperature survey (Tmax 1250°C)

### **7.2 Technical documentation**

### **7.3 Training**

- 7.3.1 The contractor must also include on-site training of at least two (2) operators (English or French) during start-up and final acceptance

### **7.4 Qualification (IQ-OQ-PQ)**

- 7.4.1 Installation qualification (IQ) report
- 7.4.2 Operational qualification (OQ) report for final acceptance.

### **7.5 Delivery on NRC Winnipeg, Ellice site**

### **7.6 The contractor must offer technical assistance by phone or internet during NRC - Winnipeg site Additive Fabrication business hours (from Monday to Friday, between 8:00 am to 4:30 pm)**

## **8 Delivery and installation**

### **8.1 The system must be delivered at:**

CNRC– Site Winnipeg  
435 avenue Ellice,  
Winnipeg, Manitoba, R3BY6

### **8.2 The equipment will be stored into this NRC site until that the new NRC Building, Additive Fabrication site will be ready**

### **8.3 The Contractor must perform the installation and commissioning by a technician or engineer from the manufacturing company on the new NRC-Winnipeg, Additive Fabrication site, Winnipeg, Manitoba, Canada ,after June 2021. The address will be provided later**

**NOTE: THE COMMISSIONING AND TRAINING WILL BE COMPLETED INTO 2020-2021 AS THE BUILDING WILL BE READY.**

### **8.4 The NRC will move the equipment to the new facility under the supervision of a technician or an engineer.**

### **8.5 The installation will be performed within the days following the equipment displacement.**

## **9 Training**

Complete training must be provided to at least four (4) users within five business days of installation. The training should cover the following elements :

- 9.1 Operation**
- 9.2. Programming:**
  - 9.2.1. Program execution,
  - 9.2.2. Data transfer and
  - 9.2.3. Communication;
- 9.3. Calibration and routine maintenance.**
- 9.4. Mechanical maintenance, replacement of consumables;**
- 9.5. Troubleshooting from error messages and alarms.**
- 9.6. For each deliverable having a controller, the supplier must provide at least a minimum of training and not limited to the following points:**
  - 9.6.1. Programming a sintering sequence;
  - 9.6.2. Programming the parameters of a sequence;
  - 9.6.3. Creation, adjustment, modification and saving of parameters;
  - 9.6.4. Digital control;
  - 9.6.5. Creation, backup and loading of sequence programs;
  - 9.6.6. Register of existing programs;
  - 9.6.7. Manufacturing parameters, creation, backup, call parameters in a sequence;
  - 9.6.8. Edition of the program;
  - 9.6.9. Error file;
- 9.7. Manufacturing data files (Process Parameters)**

## **10 Customer's responsibility**

- 10.1 Customer, NRC Winnipeg, Additive Fabrication site will be responsible to load out and to install (until the final place) of all products delivered and to take care of shipping material.**
- 10.2 Services: Water, air, electricity and building modifications.**
- 10.3 NRC is also responsible for providing water, air, electricity and any necessary modifications to the area, such as penetration and ducting through lab walls if applicable.**
- 10.4 The services are the responsibility of the customer. The Contractor must specify and indicate all required services and special requirements in their proposal**

**ANNEX « B » – BASIS OF PAYMENT**

Item	Description	Qty	Total Firm Price
1	<p><b>High Temperature Vacuum/ Partial Pressure Furnace (MIM)</b>            In accordance with the specifications set out at Annex « A ».</p> <p><b>Brand offered:</b>            _____</p> <p><b>Model offered:</b>            _____</p>	1 each	\$
2	<p><b>Technical Documentation</b>            In accordance with the specifications set out at point 5 of Annex « A ».</p>	1 lot	\$
3	<p><b>Installation</b>            In accordance with the specifications set out at point 8 of Annex « A ».</p>	1 lot	\$
4	<p><b>Training</b>            In accordance with the specifications set out at point 9 of Annex « A ».</p>	1 lot	\$
5	<p><b>Delivery</b>            DDP (Winnipeg, MB, Canada), including customs duties, handling and delivery.</p>		\$
<b>TOTAL BID PRICE (TBP) =</b>			<b>\$</b>

Solicitation No. - N° de l'invitation  
31206-208816/A  
Client Ref. No. - N° de réf. du client  
31206-208816

Amd. No. - N° de la modif.  
File No. - N° du dossier  
QCN-9-42088

Buyer ID - Id de l'acheteur  
qcn037  
CCC No./N° CCC - FMS No./N° VME

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**ANNEX « C » - CERTIFICATION AND BIDDER FORMS**

**Form – To be submitted with bid**

**REF.: 5.2.3.2 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 \_\_\_\_\_

Bidder's name \_\_\_\_\_