



**RETURN BIDS TO:**

**RETOURNER LES SOUMISSIONS À:**

Bid Receiving Public Works and Government  
Services Canada/Réception des soumissions Travaux  
publics et Services gouvernementaux Canada  
1713 Bedford Row  
Halifax, N.S./Halifax, (N.É.)  
Halifax  
Nova Scotia  
B3J 1T3  
Bid Fax: (902) 496-5016

**SOLICITATION AMENDMENT  
MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise  
indicated, all other terms and conditions of the Solicitation  
remain the same.

Ce document est par la présente révisé; sauf indication contraire,  
les modalités de l'invitation demeurent les mêmes.

**Comments - Commentaires**

**Vendor/Firm Name and Address**  
**Raison sociale et adresse du**  
**fournisseur/de l'entrepreneur**

**Issuing Office - Bureau de distribution**  
Atlantic Region Acquisitions/Région de l'Atlantique  
Acquisitions  
1713 Bedford Row  
Halifax, N.S./Halifax, (N.É.)  
Halifax  
Nova Scot  
B3J 1T3

<b>Title - Sujet</b> Metallic Power Based Fusion 3D Prin Metallic Power Based Fusion 3D Printer	
<b>Solicitation No. - N° de l'invitation</b> W7707-227170/B	<b>Amendment No. - N° modif.</b> 003
<b>Client Reference No. - N° de référence du client</b> W7707-22-7170	<b>Date</b> 2022-07-21
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$HAL-207-11541	
<b>File No. - N° de dossier</b> HAL-1-87186 (207)	<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> Atlantic Daylight Saving Time ADT <b>on - le 2022-08-04</b> Heure Avancée de l'Atlantique HAA	
<b>F.O.B. - F.A.B.</b>	
<b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Grieve, Bronwen	<b>Buyer Id - Id de l'acheteur</b> hal207
<b>Telephone No. - N° de téléphone</b> (902) 943-2394 ( )	<b>FAX No. - N° de FAX</b> (902) 496-5016
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

<b>Delivery Required - Livraison exigée</b>	<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/</b> <b>de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

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**Amendment 003 is raised to:**

- 1. Answer bidder questions**
- 2. Amend Annex "A" Requirement**
- 3. Amend Annex "B" Basis of Payment**

**1. Bidder Questions and Answers:**

Q2. Are you looking for a (PBF) Powder Bed Fusion metal additive type technology and machine? (NPP description is Powder Based Fusion)

A1: Yes, it should read "powder bed fusion" wherever "powder based fusion" appears. See amendments to Annex "A" below.

Q3. Does a Directed Energy Deposition (DED) system which uses metal powders and utilizes fiber lasers fit your NPP requirements to quote?

A2: No. DRDC requires the capabilities of a PBF AM machine.

Q4. It appears that the bid asks for powders to complete installation of the printer. For installation, we only need one material among the listed materials. The machine doesn't require to be installed for each materials and as such, there is no need to have 6 different powders for installation purpose. The builds made during the installation are to check calibration and that the machine is working as intended // quality control.

Therefore, we were planning to included 60kg of Stainless Steel Powder SS 17-4. I would simply like to clear up any misunderstanding regarding this specific item.

A3: Yes, one type of material and whichever the Bidder deems to be the best powder/quantity in order to complete the set up. See Amendment to Annex "A" below.

Q5. With reference to the Annex A, Machine Dimensions. This requirement limits number of well quality machines to propose. We believe the requested dimension does not allow many manufacturers to propose a solution for this RFP. We kindly ask Canada to remove this requirement from RFP.

A4: We will remove this requirement. See amendment to Annex "A" below.

Q6. If your bid specifications is indicated FIRM, does this mean for each of the specifications noted or just that the printer can do everything you ask?

A5: The reference to "FIRM" in Annex "A", 5.1, 5.2, 5.3, and 5.4 refers to the fact that these items are part of the firm requirement (to be provided upon contract award) as opposed to the "Optional" requirements referenced in Annexes "A" and "B" which may be ordered at a later date through a Contract Amendment.

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In order to be found technically compliant, bids must demonstrate compliance with all items listed in Annex "C" Technical Evaluation.

The successful bidder must deliver a product that meets every requirement in Annex "A" in order for it to be accepted.

- Q7. The powdered listed are non-specific, for example there are about a dozen different stainless steel powders available including (but not exclusively) 304L, 316L, 316Ti, and 17-4 - each stainless offers very different material properties. The same is essentially true of nickel alloy and 'steel' - which again are very generic.

Can we get clarification on the specific type of metals requested, or is it up to the vendor to choose?

- A7: It is up to the supplier to provide pricing for each of the materials identified in Annexes "A" and "B". DRDC has requested pricing on your most popular sub-type of powder.

Please note that no lines will be added to the Basis of Payment. Pricing must be provided in accordance with the Basis if Payment in order to be found responsive.

## 2. Amendments to Annex "A" Requirement:

### a. Under section 1. Title

DELETE: in its entirety

INSERT:

[Powder Bed Fusion](#) (Metal) 3D printer

### b. Under section 2. Background

DELETE: in its entirety

INSERT:

Department of National Defence (DND)/Defence Research and Development Canada (DRDC) currently uses traditional manufacturing equipment and techniques, which tend to limit how complex manufactured prototypes and their parts can be. Therefore, it is DRDC's intent to augment its current manufacturing capabilities, by introducing the Additive Manufacturing (AM) technique known as [Powder Bed Fusion](#) (PBF) – which is sometimes referred to as metal 3D printing. By doing so, it will provide DRDC the ability to create new alloys and print testable designs and participate with other North Atlantic Treaty Organization (NATO) countries in the research and development of the structural stability of parts created with the additive manufacturing process.

### c. Under section 3. Acronyms

DELETE: in its entirety

INSERT:

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A	Amp
AM	Additive Manufacturing
C	Celsius
CSA	Canadian Standards Association
DND	Department of National Defence
DRDC	Defence Research and Development Canada
in	Inch
lbs	Pounds
NATO	North Atlantic Treaty Organization
TA	Technical Authority
PBF	Powder Bed Fusion
HSS	High Speed Steel
kg	Kilogram
MDS	Material Data Sheet
m	Meter
mm	Millimeter
mm/s	Millimeter per Second
V	Volt
W	Watt
WXDXH	WidthXDepthXHeight
Yb	Ytterbium-Doped Silica

**d. Under section 5.1 [FIRM] Powder Based Fusion Metal 3D Printer**

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*(removing "Machine Dimension" requirement in its entirety)*

**5.1 [FIRM] Powder Bed Fusion Metal 3D Printer**

**Required Quantity: 1**

The Contractor must provide the requirement with the following specifications:

Specifications	Value
Build volume	Minimum of 250mm x 250 mm x 250mm
Scanner exposure	Exposure area of 250mm x 250 mm
Scan speed	Minimum of 6500 mm/s
Weight of machine	Minimum 1300kg
Z-axis position repeatability	$\leq \pm 0.005$ mm
Recirculating Filtration+ System	Must utilize self-cleaning filters, expected time between filter changes at 1500 laser hours
Re-coater blade	Must be either: Hard re-coaters ( high-speed steel (HSS) or ceramic blades)  OR  Soft, flexible re-coaters (a brush or silicone) Re-coating system travel speed must be minimum 40-500 mm/s.

Specifications	Value
Material Parameters	All offered materials should include published Material Data Sheets (MDS) related to build properties and be backed up by 3 <sup>rd</sup> party testing
Support	Vendor must have Support Engineers in North America
Laser Power Range	Yb fiber laser, 400W – 1000W
Power Supply	Minimum 30A, 400V
Gases Used	Nitrogen and Argon
Heated Build Platform	System must have integrated platform heating module capable of operating between approximately 40 to 200 deg C
User Interface	Touch Screen
Powder Bed Camera	Monitoring system in between coats
Materials to be Printed	Aluminum, Steel, Nickel Alloy, Stainless Steel, Titanium, Copper

**e. Under section 5.3.1 Powders:**

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**5.3.1 Powders**

The Contractor must provide enough [powder \(material of their choice\)](#) to complete the installation of the [Powder Bed Fusion](#) Metal 3D Printer as per section 5.1.

*Costs for the powders must be included in the price for the [Powder Bed Fusion](#) Metal 3D Printer in Annex "B".*

Item	Description
5.3.1.1	Stainless Steel Powder
5.3.1.2	Steel Powder
5.3.1.3	Nickel Allow Powder
5.3.1.4	Aluminum Powder
5.3.1.5	Copper Powder
5.3.1.6	Titanium Powder

**5.3.2 Accessories**

Item	Description	Required Quantity
5.3.2.1	Filters for recirculating system	3
5.3.2.2	Internal Powder Bed Camera	1

**3. Under Annex "B" Basis of Payment, Table 1 – Firm Requirements:**

DELETE: in its entirety

INSERT:

**TABLE 1 – FIRM REQUIREMENTS**

<b>Annex "A" Item</b>	<b>Description of the Deliverable</b>	<b>Unit of Issue</b>	<b>Qty (A)</b>	<b>Unit Price (B)</b>	<b>Extended Total (A x B)</b>
5.1 and 5.3.1	Metal 3D Printer as per Annex "A" item 5.1 Price must include <b>the cost of powder</b> required to complete installation of the Metal 3D Printer as per Annex "A", item 5.3.1	EACH	1		
5.2	Powder Sieve Unit	EACH	1		
5.4	Technical Data – Operations and Maintenance Manuals  (1 PDF and 2 hard copies)	LOT	1		
5.4.7	Filters for the recirculating system	EACH	3		
5.4.8	Internal Powder Bed Camera	EACH	1		
5.6	Installation	LOT	1		
5.7	Training	LOT	1		
<b>Subtotal (GST/HST not included)</b>					

**ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED**