

## **Advance Contract Award Notice (ACAN)**

### **ACAN 23-58094**

#### **TAM air calorimeters for cement and concrete samples**

##### 1. Advance contract award notice

An ACAN is a public notice indicating to the supplier community that a department or agency intends to award a good, service or construction contract to a pre-identified supplier, which allows other suppliers to signal their interest in bidding by submitting a statement of capabilities. If no supplier submits a statement of capabilities that meets the requirements set out in the ACAN, no later than the closing date indicated in the ACAN, the contracting officer can proceed with awarding the contract to the pre-identified supplier.

##### 2. Requirement definition

The National Research Council of Canada (NRC) requires the provision of two TAM Air multi-cell calorimeters for studies on the hydration and curing of cement, cementitious materials, as well as mortars and concrete. Although there are other types of calorimeters (most are adiabatic or semi-adiabatic), the 3-cell TAM Air systems for concrete samples and 8-cell systems for cement pastes are unique due to the accuracy of test results, the versatility of the sample holder (20 to 125 ml) and the ease of use that make these systems the first choice for Canadian universities and research centres interested in research on cement and concrete. Isothermal calorimetry is an appropriate method for determining the hydration heat of Portland cement and the effect of various additives and supplementary cementitious materials (SCMs) on the hydration and curing of cements.

This type of equipment is essential for studying materials intended for producing low-carbon concrete.

- The calorimeters must be differential, in other words they must be the dual type, i.e., they must consist of a sample cell and a reference cell.
- The TAM Air must be able to hold samples with a maximum volume of 125 ml, depending on the calorimetric block used. The calorimeters must be held together in a single removable block.
- The calorimeter must operate in heat-flux detection mode.
- The calorimeter's response to heat flux must be calibrated using a fixed calibration resistance.
- The TAM Air system must include the TAM Assistant software for full experimental control, data acquisition, data analysis, and reporting.

- The instrument must communicate with a computer via a USB connection.
  - Also, the instrument's software must allow multi-tasking (i.e., operations such as analyzing an existing data file can be done while new data is being collected).
  - The 8-channel calorimeter must be compatible with a variety of ampoules, including the following:
    - 20-ml glass or HDPE plastic closed ampoules, equipped with crimp seals or screw plugs;
    - 20-ml Admix ampoule for liquid injection and agitation in the calorimeter. The agitation must be manual or motorized with an adjustable agitation speed.
  - The 3-channel calorimeter must be able to accommodate at least two types of ampoules:
    - 125-ml glass closed ampoules with O-ring
    - 125-ml stainless-steel closed ampoules.
3. Assessment criteria of the statement of capabilities (minimum essential requirements)
- Any interested supplier must demonstrate through a statement of capabilities that their system meets the following requirements:

**Mandatory specifications for calorimeters**

TAM Air calorimeters must meet the specifications below. Data from the measurements taken must be included in order to demonstrate the effectiveness of the calorimeters.

	<b>3-channel calorimeter</b>	<b>8-channel calorimeter</b>
<b>Noise</b>	< 1 microwatt	< ± 8 microwatt
<b>Baseline drift</b>	< 5 microwatts/24 hours	< 55 microwatts/24h
<b>Enthalpy accuracy</b>	0.1%	
<b>Baseline repeatability</b>	2 microwatts	

**Mandatory specifications of the thermostat**

<b>Temperature range</b>	<b>5 – 90°C</b>
<b>Temperature accuracy</b>	<b>&lt; ± 0.15 K</b>
<b>Long-term stability</b>	<b>&lt; ± 0.001 K/24h</b>

- The thermostat must use air circulation and an advanced temperature control system for keeping the calorimeter's temperature very stable at  $\pm 0.001$  K.
- The high accuracy and stability of the thermostat makes the calorimeter well suited to heat flux measurements over extended periods, such as weeks.
- The thermostat must be able to accommodate two interchangeable calorimetric blocks. The 8-channel calorimeter block can accommodate eight (8) dual-type calorimeters, which makes it possible to take up to eight independent differential measurements simultaneously. The 3-channel calorimeter block can accommodate three (3) dual-type calorimeters, making it possible to take up to three independent differential measurements simultaneously.

#### 4. Trade agreements applicable to the purchase

This purchase is subject to the following trade agreements:

- Canada-Chile Free Trade Agreement (CCFTA)
- Canada-Peru Free Trade Agreement (CPFTA)
- Canada-Colombia Free Trade Agreement (CCOFTA)
- Canada-Panama Free Trade Agreement (CPAFTA)
- Canada-Honduras Free Trade Agreement (CHFTA)
- Canada-Korea Free Trade Agreement (CKFTA)
- Canada-Ukraine Free Trade Agreement (CUFTA)
- Canadian Free Trade Agreement (CFTA)
- Comprehensive Economic and Trade Agreement (CETA)
- World Trade Organization – Agreement on Government Procurement (WTO-AGP)
- Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)

#### 5. Rationale for using a pre-identified supplier

The proposed contract involves the acquisition of two multi-cell TAM Air calorimeters. The TAM Air calorimeter system is a specialized isothermal conduction unit for taking heat flux measurements in milliwatts. This unit is unique because it is about 10 times more sensitive than most calorimeters that have only one measurement channel. It also makes it possible to monitor 3 (concrete) to 8 (cement paste) samples at the same time, which is important

and saves time. Although there are other types of calorimeters (most are adiabatic or semi-adiabatic), the 3-cell TAM Air systems for concrete samples and 8-cell systems for cement pastes are unique due to the accuracy of test results, the versatility of the sample holder (20 to 125 ml) and the ease of use that make these systems the first choice for Canadian universities and research centres interested in research on cement and concrete. Isothermal calorimetry is an appropriate method for determining the hydration heat of Portland cement and the effect of various additives and supplementary cementitious materials (SCMs) on the hydration and curing of cements.

This type of equipment is essential for studying materials intended for producing low-carbon concrete. For these reasons, this supplier is the only one capable of providing these types of calorimeters due to its special area of technical expertise.

6. Exception(s) to the *Government Contracts Regulations*

The following exception to the *Government Contracts Regulations* is invoked for this purchase: paragraph 6(d) – “only one firm is capable of performing the contract”

7. Ownership of intellectual property

TA Instruments-Waters is the developer and owner of the intellectual property associated with the manufacture of the two TAM Air multi-cell calorimeters.

The calorimeters are manufactured in Sweden, but TA Instruments-Waters has a distributor for North America (Charlotte, USA) and a sales office in Montreal (Canada), which is very convenient for maintenance and repair services. This is not the case for most of the calorimeters on the market that are manufactured in Europe in general or that are artisanal devices with no warranty.

8. Proposed contract period or delivery date

- The calorimeters must be delivered and installed before March 31, 2024.

9. Estimated cost of the proposed contract

1 x TAM AIR 8-CHANNEL CALORIMETER (cement samples):  
CAN\$ 63,637.90

1 x TAM AIR 3-CHANNEL CALORIMETER (concrete samples):  
CAN\$ 66,988.78

Total: CAN\$ 130,626.68 (applicable taxes)

10. Name and address of the pre-identified supplier

**TA Instruments-Waters L.L.C. C.**  
159 Lukens Dr., New Castle, DE 19720  
[www.tainstruments.com](http://www.tainstruments.com)

11. Right of suppliers to submit a statement of capabilities.

Suppliers who believe that they are fully qualified and prepared to provide the goods, services or construction services described in this ACAN may submit a written statement of capabilities to the contact person whose name appears in this notice by the closing date, which is also specified in this notice. The statement of capabilities must clearly demonstrate that the supplier meets the published requirements.

12. Closing date for submitting statements of capabilities

The closing date and time for accepting statements of capabilities are September 22, 2023 at 2:00 p.m. ([EDT](#))

13. Request for Information and submission of statements of capabilities

Requests for information and statements of capabilities must be submitted to:

Stéphane Lajoie  
Senior Contracting Officer  
[stephane.lajoie@cnrc-nrc.gc.ca](mailto:stephane.lajoie@cnrc-nrc.gc.ca)