Award

Mechanical Cryostat for Characterisation of Advanced Materials Down to 4K

National Physical Laboratory

F15: Voluntary ex ante transparency notice
Notice identifier: 2022/S 000-030628
Procurement identifier (OCID): ocds-h6vhtk-037d8e
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Section I: Contracting authority/entity

I.1) Name and addresses

National Physical Laboratory

Hampton Road

Teddington

TW11 0LW

Email

charley.choules@npl.co.uk

Country

United Kingdom

Region code

UK - United Kingdom

Internet address(es)

Main address

www.npl.co.uk

I.4) Type of the contracting authority

Body governed by public law

I.5) Main activity

Other activity

Research

Section II: Object

II.1) Scope of the procurement

II.1.1) Title

Mechanical Cryostat for Characterisation of Advanced Materials Down to 4K

II.1.2) Main CPV code

- 38000000 - Laboratory, optical and precision equipments (excl. glasses)

II.1.3) Type of contract

Supplies

II.1.4) Short description

A cryogenic mechanical test station comprising of a 250 kN hydraulic test frame and a 250 kN load rated cryostat. The cryostat must be suitable for mechanical testing at 4K by immersing test rigs in liquid helium, at 20K in gaseous helium, at 77K in liquid nitrogen and room temperature. The mechanical test frame must have a top mounted hydraulic actuator with sufficient working distance to enable the halves of the cryostat to be separated on specimen removal and loading. Liquid helium and liquid nitrogen dewar feeds are required.

II.1.6) Information about lots

This contract is divided into lots: No

II.1.7) Total value of the procurement (excluding VAT)

Value excluding VAT: £318,000

II.2) Description

II.2.3) Place of performance

NUTS codes

- UK - United Kingdom

II.2.4) Description of the procurement

A 250 kN Servo Hydraulic Fatigue 2 column test system with actuator in crosshead with stroke of ±75mm. The test system should have a 1200 mm Tee slot table @590 mm from the floor. Height should provide at least 2690 mm working distance between table and underside of crosshead. Fitted with telescopic lift cylinders. Actuator displacement measurement accuracy of better than ±0.2% of transducer full travel.

Load measurement accuracy to 1/250th of loadcell full scale. Adaptive control system allowing continuous update of PID settings at 1 kHz. Control loop update (10 kHz) on call control axes and continuous synchronous data acquisition at 10 kHz on all sensor channels. Mixed-mode control technology allowing bi-modal and tri-modal control techniques to be used. Mechanical test system fitted with a 250 kN fully Reverse-Cycle-Fatigue-Cryostat consisting of a self-reacting load frame and cryogenic test chamber that mounts to the underside of the test machine’s upper crosshead.

The cryostat should be suitable for quasi-static and mechanical testing at fixed point temperatures of 295 K, 77 K and 4 K. The cryostat should include hardware necessary to conduct temperature-controlled tests at intermediate test temperatures in the range from 20 K to 300 K. Cryostat and test fixturing must be instrumented with temperature sensors and resistive heating elements. A four channel PID temperature controller should be provided to monitor the specimen and chamber temperature and to supply the heating power.

II.2.11) Information about options

Options: No

II.2.13) Information about European Union Funds

The procurement is related to a project and/or programme financed by European Union funds: No

Section IV. Procedure

IV.1) Description

IV.1.1) Type of procedure

Award of a contract without prior publication of a call for competition in the cases listed below

- The procurement falls outside the scope of application of the regulations

Explanation:

Instron is the only vendor that can provide a servo-hydraulic test system that is fully compatible with the existing mechanical test infrastructure within the Mechanical Test Facility at NPL. This specifically relates to existing Instron hardware (test frames, adaptors, fixtures, fittings and load cells) and software, as well as coverage under existing maintenance and calibration contracts.

Unique features of the Materials Reliability cryostat include:

(i) the cryostat is thermally and economically efficient for cryogenic tests at 4 K. Its low mass and heat load are key elements responsible for its cryogenic thermal efficiency.

(ii) The RCF test cryostat is extremely versatile regarding types of materials and test specimens that can be tested and has common threaded adapters that provide simple adaptation to different specimen styles.

(iii) The cryostat is designed with concentric indexing, axial alignment and zero backlash features to meet the demanding requirements of fully-reverse-cycle fatigue test specifications.

(iv) The cryostat has a 4-channel commercial cryogenic temperature controller and hardware to provide specimen test temperature control to ± 1K at 20 K in gaseous helium environment

(v) The cryogenic chamber is designed to operate with specimen in a positive pressure (up to 0.5 bar) sealed environment. The proven pressure seals enable the efficient use of liquid or gaseous helium with a controlled vent system to enable the capture of spent helium gas.

(vi) The system has a feedthrough spool assembly with 6 ports;

a. (2) liquid cryogen ports (1 ea. fill and exhaust ports)

b. (2) 25 mm quick connect o-ring seal ports

c. (2) 38 mm dia clearance feedthroughs ports with KF flange seal-off

IV.1.8) Information about the Government Procurement Agreement (GPA)

The procurement is covered by the Government Procurement Agreement: No

Section V. Award of contract/concession

A contract/lot is awarded: Yes

V.2) Award of contract/concession

V.2.1) Date of conclusion of the contract

31 October 2022

V.2.2) Information about tenders

The contract has been awarded to a group of economic operators: No

V.2.3) Name and address of the contractor/concessionaire

Instron

Coronation Road, High Wycombe

Buckinghamshire

HP12 3SY

Country

United Kingdom

NUTS code

- UK - United Kingdom

The contractor/concessionaire is an SME

No

V.2.4) Information on value of contract/lot/concession (excluding VAT)

Total value of the contract/lot/concession: £318,000

V.2.5) Information about subcontracting

The contract/lot/concession is likely to be subcontracted

Section VI. Complementary information

VI.4) Procedures for review

VI.4.1) Review body

NPL Management Ltd

Hampton Road

Teddington

TW11 0LW

Country

United Kingdom