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From: Director, CSIR-NPL
Tender No. 14-VI/VNS(1115)22PB/T-126

Dated: 21.11.2023

CORRIGENDUM

With reference to NPL's Global Tender ID: **2023_CSIR_731836_1**, Pre-Bid Conference (PBC) was concluded on 27.10.2023 for "Charpy and Hardness Tester (Impact Test Machine)". Consequent upon the outcome of PBC, **some changes have been made in the technical specification of captioned tender. Revised specifications are as follows:**

S. N.	Description	FINAL Specification
1.	Scope of supply and testing	Supply, installation, commissioning, demonstration and user training for Motorised Impact testing system. The system should be suitable for metallic materials for carrying out tests of standard Charpy V-notch metallic specimens (10mm x 10mm x 55mm) as per ASTM E23, ISO 148-1, & EN 10045-2 standards. The temperature range of -80 deg. C to +200 degree C or better to determine the toughness of the material, fracture toughness evaluation and Ductile Brittle Transition Temperature (DBTT)/ Fracture Assisted Transition Temperature (FATT) estimation.
2.	Capabilities of the system to be supplied	• The pendulum impact, accessories, and auxiliaries shall provide experimental capability in controlling test parameters, data acquisition, storage and retrieval for the tests to be carried out. • The pendulum impact should have the safety housing and an electrical/magnetic/electromechanical interlock or any other built-in safety mechanism, which prohibits the operation of the Pendulum impact when the door of the enclosure is open (either fully or partly). The system must be CE-compliant. Safety guard with acryl-glass with safety interlock-switch according to the safety regulations, according to DIN 51233, EN ISO 12100-1 and 2, EN ISO 13849 -1/-2, EN IEC 62061
3	System and accessories	1. The system should have a Motorised hammer lifting system including electro-magnetic release and Electro-magnetic brake for the pendulum. 2. The Pendulum impact should run in any selectable modes viz automatic/ motorized mode, manual mode, service and calibration mode. 3. Machine should have provision for to add hammers for 150, 300 or 450 Joule potential energy in future. 4. The machine shall provide impact energy in the range of 2.5 - 360 Joules or better in both sides with a resolution better than or equal to 0.1J for digital display.

		5. The system should have a continuous setting of drop height through a digital display with automatic drop height adjustment from 2.5° to 150° or higher in 2.5° steps or better. 6. The velocity of the striker on the point of impact shall be adjustable over a wide range of (2.75 m/s or lower) to (5 m/s or higher). 7. The system should have a provision for a digital display of the fracture energy. 8. The machine's total friction and windage losses during the swing in the striking direction while performing Charpy or Izod test shall not exceed 0.5 % of the scale range capacity. A Suitable striker(s) and anvil(s) to carry out impact (Charpy and Izod) tests on full-size(10x10x55) mm and sub-size specimens (7.5 x 10 x 55; 5 x 10 x 55; 2.5 x 10 x 55), complying with international standards. 9. 2 No.s of specimen handling tongs for carrying out impact tests with Charpy V-notch specimens ensuring smooth transfer from the cooling and/or heating chamber to the anvil have to be provided along with the equipment, and the respective part number has to be indicated. 10. 2 No.s of shoulders on which the V-notch and U-notch samples will be positioned before the impact test have to be provided along with the equipment, and the respective part number has to be indicated. 11. The offer should include Steel Reinforcement Frame for Foundation.
4.	Cooling Bath	1. Temperature control range of - 80 °C or lower to +200 °C or better 2. Temperature consistency: ± 0,01 °C or better. 3. Bath Volumes 8 L or higher with coolant included.
5	Motorized Charpy Broaching Machine	• The offered Motorized Charpy broaching machine should be capable of making a 2 mm Charpy V notch as per ASTM E23 standard on 10 mm x 10 mm x 55 mm type of samples. • 3 No.s of broaches should be capable of broaching the following samples: Ni-base superalloys (such as Alloy 617M, Alloy 625), steels (such as T/P11, T/P22, T/P91, Super304H, etc.) and their welds.
6	NIST Standard specimens with certificates	• NIST standard specimens covering the high energy (88J to 133J) and super high energy (176J to 244J) levels shall be provided for conducting Charpy testing. 4 sets for high energy levels and 4 sets for super high energy levels shall be provided. Each set should comprise 5 specimens. Each batch consists of 1 set of high-energy level samples and 1 set of super high-energy level samples. • One batch of standard specimen sets shall be utilized at OEM works/ factory at the time of PDI, and one more batch of standard specimen sets shall be supplied along with equipment for verification at the time of installation.
7.	Power supply	• As per Indian standard
8.	Instrumented Charpy	• The instrumented striker assembly for the Instrumented Charpy test should be attached with an integral force transducer. • The instrumentation should be equipped with integrated software and hardware packages for plotting, overlaying and analyzing the results. The system shall include a signal conditioning unit, an impact velocity measuring system with a digital display unit and a triggering unit. • The Graphical User Interface (GUI) should provide control of the impact test (impact parameters and data acquisition parameters) and analysis of the resulting data. These should include Impact parameters (Impact angle, velocity or energy), Data acquisition parameters (sample rate, sweep length).

		• High-Speed Data Acquisition System for instrumented striking edges (strikers), acc ISO14556, should include an amplifier and 2 MHz/per channel or better and high-speed A/D converter, including an interface for the Software package. • The instrumentation with a High-speed Data acquisition system allows us to measure force, displacement and energy. The system should include a linear magnetic band encoder system or better system.
9.	Safety procedures required for the equipment	• Adequate safety enclosure must be present to prevent access to the specimen and test area using electric/magnetic/electromechanical interlock or any other built-in safety mechanism (should be mentioned clearly in detail). Clear visibility for easy viewing of the specimen during testing should be provided. • The impact testing equipment must have safety-encompassing and safety regulations and must be CE-compliant.
10.	Installation of Machines	• Installation shall be done by the supplier/authorised agent at the customer site.
11.	Warranty	• Two years comprehensive warranty from the date of commissioning
12.	Spares Availability	• Supply of spares should be ensured for at least 10 years.

Therefore, following extension in due date of submission & date of opening of the said tender may be read exactly as follows:

Due date & time of tender submission
For : 21.11.2023 up to 3:00 PM (IST)
Read as: 05.12.2023 up to 3:00 PM (IST)

Date & Time of Tender Opening
For : 22.11.2023 at 3:00 PM (IST)
Read as: 06.12.2023 at 3:00 PM (IST)

All other terms & conditions of said tender will remain the same.

Sr. Controller of Stores & Purchase

CSIR- National Physical Laboratory

Minutes of the meeting

Date: 20-11-2023

Sub: TSC meeting for discussing the specifications for specifications for impact test machine (pre-bid meeting)

In connection withthe procurement of an impact test machine (Charpy and Hardness tester) costing 163 lakhs under the GAP project GAP180932, a pre-bid meeting was organized on 27th October 2023 at 12:30 noon in the second-floor conference room.Two companies participated in the pre-bid conference: i) Zwickroel and ii) Aimil (representative of Walter+Bai Ag Testing Machines, Switzerland). Both companies presented their viewpoint and suggested modifications. All the modifications/suggestionswere noted down. The comments of the company representatives were discussed to finalize the specifications. The following members were present in the meeting.

Dr. H.K. Singh, Chief Scientist (CSIR-NPL)	Chairman
Dr. Sachchidanand Singh, Chief Scientist (CSIR-NPL)	Member
Dr. Prof. Rajiv Chaudhary (Prof, DTU, Mechanical Engineering)	External Expert
Dr. Suraj Khanna, Sr. Pr. Scientist (CSIR-NPL)	Member
Mr. DrBhanuPratap Singh (CSIR-NPL)	Internal Expert
Dr. V. N. Singh, Pr. Scientist (CSIR-NPL)	Indenter

The committee discussed the technical specifications in detail, and the technical specifications finalized as Annexure-I.