



**Department of Applied Mechanics
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Ref. No: APM/2019/001/CLR

Split Hopkinson Pressure Bar (SHPB)

DATE: 24.05.2019

DUE DATE: 13.06.2019

- 1) Quotations are invited in duplicate for the various items shown in Enclosed list (Annexure - I).
- 2) Quotations are invited as TWO-BID system, i.e., **technical bid and financial bid**.
- 3) The Quotations duly sealed and super scribed on the envelope with the reference No. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above.
- 4) The Quotations should be valid for sixty days from the due date and the period of delivery required, warranty terms etc. should also be clearly indicated. A minimum of two year warranty required.
- 5) Brochure detailing technical specifications and performance, list of industrial and educational establishments where the items enquired have been supplied must be provided.
- 6) Compliancy certificate is to be provided indicating conformity to the technical specifications.
- 7) If the item is under DGS&D Rate contract No. and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price (Please note that we are not Direct Demanding Officers). If so please send copy of the RC.
- 8) Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable. Samples / machine/ equipment if called for should be submitted / demonstrated at free of charges, and collected back at the supplier's expenses.
- 9) Packing and delivery charges must be clearly indicated.
- 10) The rate of sales / General Taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for Sales / General Taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have concessional Sales Tax applicable to nongovernment Educational Institutions run with no profit motive for which a concession. Sales Tax Certificate will be issued at the time of final settlement of the bill.
- 11) Goods should be supplied carriage paid and insured.
- 12) Goods shall not be supplied without an official supply order.
- 13) Payment: Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later.
- 14) In case of LC, 90% of the payment will be made after completion of the supply. The balance 10% of the payment will be made after satisfactory installation of the software.

- 15) IIT Madras is exempt from payment of Excise Duty and is eligible for concessional rate of custom duty. Necessary certificate will be issued on demand. IIT Madras will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above
- 16) Acceptance and Rejection: - I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

Yours faithfully
C. Lakshman Rao,
Department of Applied Mechanics.

Technical Specifications for Split Hopkinson Pressure Bar (SHPB) System Mechanical unit

The Split Hopkinson Pressure Bar (SHPB) System is used for testing different materials at high strain rates in compression. Original equipment manufacturer (OEM) is required to supply one Split Hopkinson Pressure Bar system to IIT Madras which can be used to test materials in compression mode and it should meet the following technical requirements.

- 1) The Split Hopkinson Pressure Bar (SHPB) System should be capable of conducting compressive testing at strain rates ranging from 300 s^{-1} or less to 8000 s^{-1} or more at room temperature. The minimum & maximum values attained by SHPB system should be indicated by the OEM in technical bids.
- 2) The Original Equipment Manufacturer (OEM) has to fabricate the SHPB system with High strength material so that all Al alloys, Cu- alloys, Mg alloys, Ti base alloys, Ni-base & Co-based super alloys (typical yield strengths of these materials would be varying from 600 MPa to 1400 MPa) can be tested in the strain rate ranges mentioned above in compression mode.
- 3) The OEM has to design the Split Hopkinson Pressure Bar (SHPB) system and its accessories so as to facilitate high temperature testing (in compression: 300 s^{-1} or less to 8000 s^{-1} or more) ranging from room temperature to $80 \text{ }^\circ\text{C}$. Maximum temperature comfortably attainable by the SHPB system with no deleterious effect on the results as well as on the instrument should be indicated by the OEM in technical bids.
- 4) Striker bar, incident bar, transmitter bar should be made up of same material and should be having same 12.5 mm diameter. All the bars should have a straightness of 0.1 mm/m or a value lesser than 0.1 mm/m.
- 5) The OEM is required to supply different length of striker bars, incident bars, transmitter bars in such a way that it can achieve the above mentioned strain rate ranges in compression for testing different materials and yet these bars should be in their elastic regime throughout the testing for avoiding deformation of these bars.
- 6) The OEM is required to supply two sets of incident bars and transmitter bars (including four striker bars of different length but of the same material) made up of AA7075-T6 alloy that will be precipitation hardened and having room temperature yield strength of approximately 505 MPa or above.
- 7) The OEM is required to supply two sets of incident bars and transmitter bars (including four striker bars of different length but of the same material) made up of maraging steel grade 350, having room temperature yield strength 2200 MPa or above.

- 8) The OEM is required to supply two sets of incident bars and transmitter bars (including four striker bars of different length but of the same material) made up of polymeric material.

ANNEXURE – I

Deliverables for Split Hopkinson Pressure Bar (SHPB) mechanical unit

S. No	Description	Technical Specification	Quantity
1	Striker bar	Diameter : 12.5 mm Length : 200,400,600,800 mm Material : Maraging Steel grade 350 alloy, Aluminium alloy 7075, Polymeric	02 sets/material
2	Incident bar	Diameter : 12.5 mm Length : 1200 mm Material : Maraging steel grade 350 alloy, Aluminium alloy 7075, Polymeric	02 sets/material
3	Transmitter bar	Diameter : 12.5 mm Length : 1200 mm Material : Maraging steel grade 350 alloy, Aluminium alloy 7075, Polymeric	02 sets/material