Technical Specifications for a ±2kN Biaxial Fatigue Testing System for Cruciform Specimens with an Environment chamber (for Project: ASE1718146ARBXHSNM)

S.No.	Parameter	Requirement
1	Frame type	• Standalone self reacting frame with a rigid base with a damper to avoid vibrations. • Frame should be designed for testing cruciform specimens. • It should have provision for fixing the specimen such that the gage section surface view (both surfaces) is not obstructed. This is required for strain measurements using digital image correlation using images from a digital camera. So, the space should be such that cameras could be accommodated to view both the gage section surfaces. • Frame is required for: (a) ±2kN cyclic loading capability (b) ±10kN static loading capability. It is preferable if both could be achieved in the same frame. Otherwise, two separate options may be given. Only one of these two options will be chosen.
2	Load capacity	±2 kN (Bi-directional)
3	Loading frequency	Up to 1Hz
4	Servo-hydraulic actuator	Double acting cylinder configured for 200mm/s (a) displacement synchronous control of same axial jaws, (b) proportional and non-proportional loading control for displacement of different axial jaws.
5	Hydraulic power pack with distribution manifold and the required hydraulic hoses	• With pressure and return line accumulators and filters (<10micron) with electrical clogging indicator. • Pressure and temperature indicators • Operating pressure: 210 bar • Gear pump: Bosch or equivalent • Relief valve to limit system pressure Should trip against over temperature, low oil level, filter clogging, phase failure and motor overload safety interlocks • Remote as well as local power pack operation • Variable frequency drive based controller to achieve required combination of flow and pressure from the power pack • Cooling tower with mounting stand
6	Cross head travel	100 mm
7	Actuator accuracy	Displacement accuracy better than 0.1micron with corresponding test speed accuracy-required for rate dependent material
8	Load cell accuracy	± 0.5% of applied load from 10% to 100% capacity (0.05% of the capacity)
9	Grips	• Material to be tested: Polymers and aluminum sheets • 30mmX30mm grip area • Thickness: 13 to 20mm • Hydraulic or pneumatic double acting actuation to ensure self alignment
10	Distance between grips	300mm (cruciform specimens)
11	Environmental	Temperature range: (-40°C to +55°C)

	chamber	Controlling rate: 3°C / min
12	Servo-controller	Three stage data filtering, oversampling and user selectable digital filters; Digital loop update frequency 8kHz 8 channel DAQ system
13	Biaxial application software	• Programmable frequency, amplitude, phase difference and wave form of loading on each axis • Control 4 actuators independently and simultaneously, in-phase and out-of-phase conditions • Standard waveform Sine, Square, Ramp and custom waveforms • Output in the form of CSV or XLS or ODF • Specimen auto centering feature • Real-time display of test parameters • Real-time graphics package to enable view, recording and export of acquired data • Perform static and dynamic testing • Test in stroke, load and strain control modes • Multi step programming

Additional Requirements:

1. Vendors should provide continuous technical support and maintenance of equipment.
2. Vendors have to provide warranty for a minimum of one year. Approximate cost of annual system support/ maintenance contract once the warranty period is over has to be quoted for a period covering 5 years from the date of purchase. Payment for the AMC will be made only at the end of warranty period on yearly basis.
3. Vendors must have sufficient experience in supplying similar equipment (biaxial testing systems) in reputed organizations for research purpose. They must provide references of end users whom we can contact for their experience with the supplied machine. Experience of the end users will also be used as a criterion for the selection of bids that meet technical requirements.
4. Vendors must provide detailed documentation for the equipment.
5. Vendors may be called to visit and give presentation/demonstration on the equipment after opening the technical bid. They need to provide the approximate date for this presentation in the bid. The time period for this presentation would be 14 days from the date of opening of the bid.
6. Vendors must provide training to our technical staff for using the equipment.
7. All the expenses for installation, training and post sales technical support will be borne by the vendor.

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