Specifications for 1 MN axial dynamic capacity compression/flexure/tension testing system

- Four-column servo hydraulic load frame with cross-head mounted actuator with system stiffness of at least 1.5×10^9 N/m
- Hydraulic lifts and clamps for accommodating tests on short and long specimens.
- System must have emergency stop button
- Test space should be at least 700 mm wide, 400 mm deep and 2.8 m high (including load cell but not including specimen fixtures)
- T-slotted base with minimum dimensions of 900 mm × 900 mm (in plan), and 250 mm depth
- Double ended, double acting actuator with dynamic capacity of +/-1.2 MN in compression and tension
- Actuator stroke of at least +/-125 mm, with internal LVDT
- Load cell must be mountable on end of actuator piston or on load frame base
- Load cell must be at least 1.2 MN fatigue rated with at least 150% static overload capacity
- System calibration accuracy including cables and electronics must be 1% or better
- All adapters for load cells and grips to be supplied
- System must be capable of tests with +/- 0.1 mm displacement at 10 Hz under fully reversed fatigue loading at +/-1 MN with maximum hydraulic power supply of 200 LPM. Supplier must submit performance data with quotation.
- System must be compatible to use with a common hydraulic power pack (200 LPM) shared with one or two other systems
- System must have independent hydraulic service manifold with on/off low and high pressure control; The ability to set variable low pressure from about 1 to 20 MPa is required.
- Servohydraulic system must have software selectable low flow manifold setting for quasi static testing and specimen installation
- Servohydraulic system should also permit stable quasi-static testing such the application of a constant load of 100 kN
- Hydraulic grips for tension tests of circular rods and flat specimens with a capacity of +/-1 MN, capable of fully reversed fatigue loading. Wedges should be provided for specimens 10-40mm.
- Must have stand-alone hydraulic grip control and supply
- 2 (two) fatigue rated load cells of +/-1.2 MN and +/-100 kN capacity
- Compression platen for 150 mm diameter specimens
- PC with software for control, test definition and data acquisition using Windows 8
- Control system with loop closure rate of at least 2 kHz and four channels of control including load and stroke
- Controller shall support Proportional, Integral, Derivative, and Feed-forward (PIDF) control.
- Controller shall support Channel Limited Channel control with the second feedback signal providing means for limiting the actuator.
- Controller shall support Dual Mode control with two feedback signals to provide better control stability.
- Controller shall provide for changes in stiffness on non-linear specimens.
- Controller must allow for any and all inputs to be assigned to any control channel by the user without requiring re-arranging controller hardware.
- Controller must allow for any and all output channels and input channels to distributed in any manner desired by the user via software, without requiring any controller hardware to be re-arranged.
- Control software shall have ability to automatically recognize added controller hardware.

- Controller supports options to create and edit files to specify custom and/or arbitrary waveforms.
- Controller shall have optional handset to provide remote operation to enable convenient installation and replacement of test specimens in the test station. Handset should have: exclusive Control to prevent initiation of actuator movement from any other source; precise control of actuator movement; dedicated Run/Stop/Hold keys; and ability to start, pause, and stop the test application program
- Controller must have minimum 3 DIO and 2 +/-10 V analog outputs in base configuration
- Controller must be expandable to at least two independent test stations with common hydraulic power pack
- Controller must have option to condition and acquire data up to 1000 kHz for at least 8 specimen strain gages
- Controller must support either 2 or 3 stage valve drivers
- Controller Software must provide ability to see the status of test systems from anywhere at any time through an easy-to-use web or mobile interface.
- UPS to be supplied with system to guard against power loss
- Test software to provide standard templates for running monotonic (tensile, compression, bend) and cyclic tests (fatigue)
- Software to have freely configurable run time view (show an unlimited number of variables, meters. charts and tables). Show the test flow while the test is proceeding, indicate active vs. finished actions.
- All test templates that support testing against standards can be modified by the user using the graphic interface (no requirement to change source code). All variable definitions and calculations as well as the test flow/sequence and logic are visible and can be changed by the user.
- Software must support data acquisition modes according to time, peak/valley, level crossing, cyclic / logarithmic
- Software to allow function generation up to 100 Hz on all channels including Sine, square, triangle, ramp, hold, profile and custom waveforms
- Software test design to support parallel branches for test execution and logical opertors (if/then, while)
- Software to provide limit sensing, sequencing triggers, and interface to digital I/O
- Software must support test report generaton while the test is. Must be possible for user to create custom reports in Microsoft Excel that the test software can use to automatically generate report resuts.
- Software provides ability to generate custom and standard reports from existing test data, as a process independent from testing.
- System should be usable under local conditions, and must be installed and commissioned with no additional costs
- System should be supplied within 8 months of order

Specifications for 1 MN axial capacity dynamic tension testing system

- Four-column load frame with cross-head mounted actuator with system stiffness of at least 1.5×10^9 N/m
- Hydraulic lifts and clamps for accommodating tests on short and long specimens.
- System must have emergency stop button
- Test space should be at least 700 mm wide, 400 mm deep and 2.8 m high (including load cell but not including fixtures)

- Double ended, double acting actuator with dynamic capacity of +/-1.2 MN in compression and tension,
- Actuator stroke of at least +/-125 mm, with internal LVDT
- Load cell must be mountable on end of actuator piston or on load frame base
- Load cell must be at least 1.2MN fatigue rated with at least 150% static overload capacity
- System calibration accuracy including cables and electronics must be 1% or better
- All adapters for load cells and grips to be supplied
- System must be capable of tests with +/- 1 mm displacement at 5 Hz under full fully reversed fatigue loading at +/-1MN with maximum hydraulic power supply of 200LPM
- System must be compatible to use with a common hydraulic power pack (200 LPM) shared with one or two other systems
- System must have independent hydraulic service manifold with on/off low and high pressure control; The ability to set variable low pressure from 1 MPa to 20 MPa is required.
- Servohydraulic system must have software selectable low flow manifold setting for quasi static testing and specimen installation
- Servohydraulic system should also permit stable quasi-static testing such the application of a constant load of 100 kN
- 2 (two) fatigue rated load cells of +/-1 MN and +/-100 kN capacity
- PC with software for control, test definition and data acquisition using Windows 7
- Control system with loop closure rate of at least 2 kHz and four channels of control including load and stroke
- Controller shall support Proportional, Integral, Derivative, and Feed-forward (PIDF) control.
- Controller shall support Channel Limited Channel control with the second feedback signal providing means for limiting the actuator.
- Controller shall support Dual Mode control with two feedback signals to provide better control stability.
- Controller shall provide option for changes in stiffness on non-linear specimens.
- Controller must allow for any and all inputs to be assigned to any control channel by the user without requiring re-arranging controller hardware.
- Controller must allow for any and all output channels and input channels to distributed in any manner desired by the user via software, without requiring any controller hardware to be re-arranged.
- Control software shall have ability to automatically recognize added controller hardware.
- Controller supports options to create and edit files to specify custom and/or arbitrary waveforms.
- Controller shall have optional handset to provide remote operation to enable convenient installation and replacement of test specimens in the test station. Handset should have: exclusive Control to prevent initiation of actuator movement from any other source; precise control of actuator movement; dedicated Run/Stop/Hold keys; dedicated Manual Command key and LED; ability to auto-offset selected transducer signals; and ability to start, pause, and stop the test application program
- Controller must have minimum 3 DIO and 2 +/-10V analog outputs in base configuration
- Controller must be expandable to at least two independent test stations with common hydraulic power pack
- Controller must have option to condition and acquire data up to 1000 kHz for at least 8 specimen strain gages
- Controller must support either 2 or 3 stage valve drivers
- Controller Software must provide ability to see the status of test systems from anywhere at any time through an easy-to-use web or mobile interface.
- UPS to be supplied with system to guard against power loss

- Test software to provide standard templates for running monotonic (tensile, compression, bend) and cyclic tests (fatigue)
- Software to have freely configurable run time view (show an unlimited number of variables, meters. charts and tables). Show the test flow while the test is proceeding, indicate active vs. finished actions.
- All test templates that support testing against standards can be modified by the user using the graphic interface (no requirement to change source code). All variable definitions and calculations as well as the test flow/sequence and logic are visible and can be changed by the user.
- Software must support data acquisition modes according to time, peak/valley, level crossing, cyclic / logarithmic
- Software to allow function generation up to 100 Hz on all channels including Sine, square, triangle, ramp, hold, profile and custom waveforms
- Software test design to support parallel branches for test execution and logical opertors (if/then, while)
- Software to provide limit sensing, sequencing triggers, and interface to digital I/O
- Software must support test report generaton while the test is. Must be possible for user to create custom reports in Microsoft Excel that the test software can use to automatically generate report resuts.
- Software provides ability to generate custom and standard reports from existing test data, as a process independent from testing.
- System should be usable under local conditions, and must be installed and commissioned with no additional costs
- System should be supplied within 8 months of order

Specifications for 200 lpm hydraulic power pack

- Pump for supplying oil at 200-230 bar pressure with a capacity of 200 litres per minute
- 70 dB noise compensated or better
- Water cooled with SST heat exchanger
- At least 3 micron filtration.
- To be used with servohydraulic mechanical testing machines
- Pump to support 2 or more test systems
- Pump must be capable of integrating with multiple test stations for pump on/off/interlock control
- Pump interlock triggered by low oil level or over temp; must have indicators and ability to communicate status to test controllers
- Pump should have operator display panel with pump status, alarms and limits
- Pump must provide facility for future capacity expansion in same chassis, using same pump control module up to at least 400 lpm. Cost should be indicated for expansion with a module of 100 lpm capacity.
- System should be usable under local conditions, and must be installed and commissioned with no additional costs
- System should be supplied within 8 months of order