




**TECHNICAL CLAUSES FOR THE ACQUISITION OF A
RESONANT FATIGUE TESTING MACHINE**

Gijón, June 4, 2020

	<p>Technical clauses for the acquisition of a Resonant fatigue testing machine</p>	<p>www.idonial.com info@idonial.com T +34 984 390 060 F +34 984 390 061</p>
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TECHNICAL CLAUSES

Technical description for the acquisition of a *Resonant fatigue testing machine*:

- 0) New design and manufacture (not refurbished)
- 1) Minimum load capacities
 - Maximum peak load: ± 150 kN
 - Peak to peak load range: 150 kN (± 75 kN)
 - Maximum static load: ± 150 Kn
- 2) Recommended load capacities:
 - Maximum peak load: ± 250 kN
 - Peak to peak load range: 250 kN (± 125 kN)
 - Maximum static load: ± 250 kN
- 3) Gripping device for cylindrical threaded head specimens, through-zero loading capable, capable of holding 1 metric threaded specimen in each of the following ranges:
 - Between M12 and M16
 - Between M20 and M32
 - Between M48 and M70

Indicate the allowable load for each metric.
- 4) Friction or mechanical interference clamping tool for cylindrical head specimens, through-zero loading capable, capable of clamping 1 specimen in each of the following head diameter ranges:
 - Between 6 and 7 mm
 - Between 10 and 12 mm
 - Between 16 and 18 mm

Indicate the allowable load for each diameter.
- 5) Optionally, hydraulic grips for cylindrical specimens with at least ± 100 kN dynamic load capacity, capable of gripping specimens with diameters from 4 to 24 mm, through-zero loading capable.
- 6) Hydraulic grips for flat specimens with at least ± 80 kN dynamic load capacity, capable of holding specimens of thickness between 0.5 and 24 mm. Through-zero loading capable.
- 7) Three-point bending fixture for fracture mechanics up to 50 kN and maximum span of 300 mm.
- 8) Load cell suitable for the loads to be measured, class 0.5 from 2.5 kN to the maximum peak load of the machine. Additional smaller load cell may be required. Equipped with accelerometer for inertia compensation.
- 9) Control: at least 10 kHz at 24 bits. Control by position, load or strain channel (extensometer). At least 2 digital inputs and 2 digital outputs and 1 analog input and 1 analog output 0-10V.
- 10) User interface: PC equipped with the necessary peripherals, 22" screen minimum; 8Gb RAM memory minimum. Quad-core processor minimum.
- 11) Software. Able to program constant amplitude fatigue waveforms and by blocks of different amplitude in position, load or strain control. Continuous or interval recording of test results.

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- 12) Software suitable for programming, controlling and recording fracture mechanics pre-crack test and crack growth rate tests, in both cases controlling crack size by means of a COD extensometer.
- 13) Adapter for connecting an existing axial extensometer and a COD extensometer (not necessary simultaneously). Controller prepared to measure and control this channel.
- 14) Software, manual and other documentation must be in Spanish or English.
- 15) Sound insulation cabin with 4 side walls with one door plus roof. Removable roof and/or side wall to facilitate entry of machinery when assembling parts and clamps. At least 80 cm space in all directions between machine and cabin. Noise absorption capacity of at least 35 dB. Assembly and installation.
- 16) Two years warranty, including maintenance and free calibration after one year.
- 17) The offer must include the theoretical frequency response for:
 - Cylindrical probe M8 heads, calibrated area 5mm in diameter and 30mm in length.
 - Cylindrical test tube with 25mm diameter heads, 15mm diameter and 75mm length.
- 18) Data from specimens with similar characteristics will be accepted. The type of gripping device used must be indicated.

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TO OFFER SEPARATELY

- 1) Transport to IDONIAL's facilities in:

Parque Empresarial Principado de Asturias, c/ Calafates, Parcela L-3.4
33417 Avilés, Asturias, Spain
- 2) Installation, commissioning, calibration and training.
 - Static and dynamic load calibration.
 - Verification and correction (if necessary) of the alignment according to MIL1312. Preferably according to ASTM E1012.

In both cases, maximum permissible bending deformation of 5% at 20 kN and 75 kN.

 - User training in the handling of accessories, clamps, control software.
 - Carrying out 4 verification/training tests on specimens of different geometry/size (cylindrical M8, cylindrical diam. 20 mm; flat #2 mm; three-point bending for fatigue crack growth rate da/dN).