

Rheinmetall NIOA Munitions ICN Gateway Expression of Interest (EOI) Mechanical Testing Tools

RNM is seeking Expressions of Interest (EOI) from a suitably qualified business interested in the Supply of Mechanical Testing Equipment for Maryborough, QLD	
Scope of Works	Supply of Mechanical Testing Equipment for production control of artillery – projectile.
RNM Reference	RNM-2004
Project Description	RNM will construct a new, advanced forging and manufacturing plant located on a greenfield site within an existing industrial precinct in Maryborough, Queensland. The facility will manufacture large caliber artillery projectile shells with an initial operating capacity of 30,000 artillery shell cases per year. The Specimen properties are length 1200mm, diameter 155mm, wall thickness 20mm, weight 20kg.
Scope	<p>RNM is looking for EOI from companies willing to undertake the Supply of Mechanical Testing Equipment for production control of artillery – projectile – cylindrical steel bodies. The equipment required is listed below and included with the EOI is the specifications for each piece of equipment.</p> <ul style="list-style-type: none"> • Metal Tensile Testing Machine • Impact Pendulum Charpy Tester • Charpy impact specimen notch broaching machine • Hardness Testing machine • Metallography microscope for dimensional measuring and microstructure analysis <p>PLEASE NOTE: We would like to give opportunity for all suppliers so even if you can only supply 1 item or all items please submit your EOI.</p>
Location of Works	52 Industrial Av, Maryborough West, QLD, 4650 (Lot 1, SP270124)
Delivery Schedule	It is anticipated that shortlisting will occur in June 2020 with progression to a tender and proposal process in August 2020.
ICN Gateway URL	https://www.rnm.icn.org.au/
General Information	
RNM and Industry Capability Network (ICN) invite registration of interest in this package provided that the contractors and suppliers meet the pre-requisite of selection criteria to accommodate the technical and commercial capability to undertake the scope of work to be considered for prequalification.	

RNM – ICN GATEWAY EOI

Metal Tensile Testing Machine

Specimen properties – length 1200mm diameter 155mm wall thickness 20mm weight 20kg.

Material properties – Tensile strength Rm- 100 – 1300 MPa

Special requirements for tensile testing/tensile demands

- Depending on hardness testing results the weakest + hardest material of charge will be tested by tensile test.
- Tensile specimen shape: B10 x 50, threaded heads
- Required tensile force: Cross sections 78,5mm² x 1300MPa = > 102050N = tensile testing machine 200kN
- Required results – RP0,2/Rm/A5,65
- Suitable tensile test machine with control of testing mode Type A (elongation speed) and Type B (stress load)
- Simple clamping device with slots to insert specimen with pre-mounted fixtures.

Impact Pendulum Charpy Tester

Specimen properties – length 1200mm diameter 155mm wall thickness 20mm weight 20kg.

Material properties – Tensile strength Rm- 100 – 1300 MPa

Special requirements for hardness testing

- Specimen properties – prepared samples according to ISO 148
- Material properties – Energy of specimen > 60 to 80 Joule
- Hint: ISO 148 mandatory says: Used energy must not exceed 80% of nominal energy (300x0,8=240J)
- If materials are very ductile/tough this requires often much more energy than minimum limit of 80 Joule
- Please check and be sure not to exceed 240 Joule to avoid damage of equipment

Charpy Impact Specimen Notch Broaching Machine

Specimen properties – length 1200mm diameter 155mm wall thickness 20mm weight 20kg.

Material properties – Impact level > 80 Joule

Special requirements for impact specimen notch broaching

- Samples must be prepared I dimensions 55x10x10 within the limits of ISO148 specimen accuracy
- The hardness of the material should not exceed 40 HRC (given: max 40 HRC/405 Brinell)

Hardness Testing Machine

Specimen properties – length 1200mm diameter 155mm wall thickness 20mm weight 20kg.

Material properties – Hardness about 340 – 405HB10/300

Special Requirements for hardness testing:

- Testing demands 100% with method HB10/3000
- 100%testing frequency/relatively easy specimen (20kg) require a motorized spindle for vertical positioning
- The round shape (testing on radial surface of projectile require a specimen clamping nose for save clamping
- The huge size of the specimen requires a huge testing table 800 x 600mm (testing position relatively in the centre
- Specimen surface will be milled before testing: Flat testing area (shape correction anyway not required for $\varnothing > 40\text{mm}$)

Metallography Microscope for Dimensional Measuring and Microstructure Analysis

Specimen properties – length 1200mm diameter 155mm wall thickness 20mm weight 20kg.

Material properties – Hardness less than 40 HRC/405

Special Requirements for microstructure analysis:

- Huge specimen be pre-cut and in prepared in and quality of metallography samples (grinded and polished)
- The task for this equipment is dimensional ted (cracks, fusion mounted tube/bottom, microstructure analysis
- Magnification 5x/10x/20x/50x
- Camera software for image storing, dimensional measuring, microstructure analysis manual image comparison