**Specification Requirements**

**Supply, delivery and installation of a Micro-Macro hardness testing machine**

**For: Engineering Materials, HSE-Science Division; Major Hazards Capability Group - V04/02/21**

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| **Area** | **Requirements** | **Explanatory notes** |
| **Basic information** | * Micro-Macro hardness testing machine for the hardness testing of metals
* Must be capable of carrying out Vickers Hardness testing and Vickers micro-hardness testing of prepared metal samples
* Must be Bench mountable
* Must comprise rotating turret capable of taking at least one hardness indenter and at least two magnifying objectives
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| **Hardness types** | * Essential requirement is ability to measure Vickers hardness and Vickers micro-hardness
* Desirable is the ability to also measure Brinell and Knoop hardness
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| **Indenters** | * Minimum requirement is Vickers hardness indenter
* Desirable that the machine can also be used for Brinell and Knoop hardness with additional indenters.
* Please state how many different indenters the turret can be loaded with at any one time
 | In the case that different indenters can be used, please state the cost of a Brinell indenter and a Knoop indenter separately. |
| **Load range** | * Essential load range is 10 g to 30 kg
* Desirable minimum load is 1 g
* Desirable maximum load is 60 kg
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| **Objectives** | * Machine must be provided with both x10 and x50 magnification objectives
* These must be located in a turret system enabling easy swapping between magnifications
* The machine must have the facility for fitting of other additional higher magnification objectives
 | In the case that different objectives can be fitted, please state the cost of a x100 objective separately. |
| **Stage size and control** | * Stage must have automatic control
* Option for manual stage control is desirable
* Minimum stage size of 200 mm x 200 mm
* Larger stage size is desirable
* Controllable in X and Y directions
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| **Sample levelling and retention** | * Any jigs or holders required to ensure sufficient restraint and levelling of the sample must be included in the total price
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| **Indentation positioning** | * Equipment must have options for manual and automatic positioning of indentations
* Ability to programme indentations at set locations along a line in the X and Y directions
 | Ability to programme a 2D grid of indentations at set spacings in both directions is desirable |
| **Hardness value calculation** | * Automatic measurement of indentations and calculation of hardness measurements is required
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| **Photographic Imaging** | * Ability to capture images of specimen surface with indentation locations is required
* Ability to capture and transfer such photographic files in standard formats (JPEG etc) is required
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| **Dimensions and mass** | * Please state width and length of unit
* Please state foot print of machine
* Please state mass of machine with all attachments
 | Unit must fit on bench top of width 850 mm |
| **Installation and setup** | * Installation, set-up and training (within current limits of access/distancing restrictions) must be included as part of price
 | Installation location is Buxton, Derbyshire |
| **Software** | * Please include all necessary standard software and control systems (PC, touch screen etc) in the quoted price
* Please state whether software maintenance and updates are FOC. If not please state approximate annual cost of software maintenance fee.
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| **Warranty** | * Please state warranty period
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| **Lead time** | * Please state best lead time from receipt of order
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Bids will be evaluated and awarded on a Most Economically Advantageous Tender (MEAT) basis, including the ability to deliver before 31 March 2021.