**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 |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **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. |  |
| **Warranty** | * Please state warranty period |  |
| **Lead time** | * Please state best lead time from receipt of order |  |

Bids will be evaluated and awarded on a Most Economically Advantageous Tender (MEAT) basis, including the ability to deliver before 31 March 2021.