



No. NML-FG/MTE-MS/34-19/Corr-I

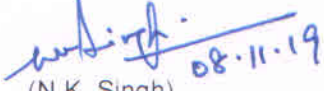
Date: 08.11.2019

CORRIGENDUM - I

Sub: Tender for supply of Upright Metallurgical Microscope with Digital Imaging Facility.

Ref: 1) Enquiry No. NML-FG/ MTE-MS/34-19 Dated 29.10.2019
2) CPPP Tender ID No. 2019_CSIR_488147_1

With reference to the above procurement, It is informed that technical specification has been revised as per Annexure I. The bid may be submitted as per the revised technical specifications. All other terms and conditions will remain unaltered.


(N.K. Singh)

Stores & Purchase Officer

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Upright Metallurgical Microscope with Digital Imaging Facility & Hot Stage Application

Scope:

Optical microscope should be used to observe, to capture and to analyze microstructures (Grain size, Multi-phase analysis etc.) of ferrous as well as non-ferrous materials up to 1000x. It should be capable to record the morphological changes in the microstructures when subject to a variable temperatures from ambient to 1500°C with a provision of vacuum/inert.

Technical Specification

1. Microscope should have reflected light LED / halogen (12v-100w) illumination with constant color temperature and a built-in stable power supply. It should have contrast technique like Bright field, Dark field, Polarization and C-DIC / Oblique illumination Contrast.
2. Revolving nosepiece should have 5/6 fold for Bright field and dark field objectives. Revolving nosepiece should be manual. Nosepiece may be encoded or the system as a whole should have the facility to prompt the user to choose the magnification during acquisition for scaling.
3. Microscope should have an infinity corrected optical system.
4. For coarse and fine focusing, coaxial double knob is required.
5. Trinocular phototube should have maximum 30° viewing angle. It should have a provision of inter-pupillary distance adjustment in the range of 55-75 mm. Beam splitter position should have provision of splitting the beam 50:50 between eye pieces and camera for simultaneous use or Two-way beam splitter (100:0 and 0:100).
6. Microscope should have XY-stage with hard coat anodized/ceramic stage plate with travel range of 75 x 50 mm or more. Stage should have stage bracket and XY-drive. Slide holder for metallurgical samples should be supplied.
7. Microscope should have minimum four positions reflector turret, which are for enabling different contrasting mechanism (bright field and dark field). Aperture and field diaphragm should be centerable. It should consist of slots for polarizers & analyzer.
8. Microscope should have reflector for bright field and dark field.
9. Microscope should have Polarizer for reflected light Polarization.
10. Microscope should have rotatable analyzer (180° / 360°) and it is to be used for reflected light.

11. Microscope should have Plan Semi-Apochromatic grade of objectives, suitable for bright field and dark field contrast for 5x, 10x, 20x, 50x & 100x magnifications.
12. Plan Semi-Apochromatic Objective should have long working distance suitable for hot stage. For hot stage, objective should have 5x, 10x, 20x and 50x, with suitable working distance.
13. Microscope should have C-DIC/Oblique illumination contrast for all the objectives.
14. Microscope should have wide-field eyepiece pair of 10x magnification with 22 field number or more. Both the eyepiece should be focusable & adjustable.
15. Microscope should have high performance **Color Digital Camera System**. Basic resolution should be 1920 x 1200 pixels or more, having minimum pixel size of 5.5 μ m x 5.5 μ m or less for better sensitivity. A software controlling camera should have provision of variable image acquisition rate up to 30 frame per second (fps). C-mount adapter should be of 0.63x/ 0.7x, which is used for the digital camera. Software driver for proper synchronization of the camera and hot stage is to be included.
16. Heating stage as per the following specifications:
 - i) Temperature Range: ambient to 1500°C
 - ii) Heating rates from 1 to 200°C/min
 - iii) Temperature stability 1°C
 - iv) Suitable thermocouple for temperature measurement
 - v) Sample cup sizes: 7mm diameter x 3mm deep
 - vi) Suitable for reflected light
 - vii) Clamps for directly fixing to microscope sub-stage
 - viii) Water cooling connections for stage lid and body
 - ix) Vacuum pump enabling pressure as low as 10⁻³ mbar with 1.5 to 2 L capacity
 - x) Argon gas cylinder for inert atmosphere
 - xi) should be upgradable to cooling module.
17. Image analysis software with facilities for image calibration as per different objective magnifications, Scaling / micron bar, measurement such as length, area, angle, annotation. Video-overlay of temperature parameter with program-controller-synchronization. Dedicated modules for Multi-Phase analysis and Grain analysis confirming to ASTM E112, E930, E1382, DIN/EN/ISO 643 standard.

18. Desktop Computer - should be i7 or advanced processor, 1Tb hard disk, 8 Gb RAM, 2 Gb external Graphics Card and original Windows 10 operating system, Optical Mouse, keyboard, along with suitable system software. Monitor should be of minimum 22 inch. Computer should have suitable interface with the supplied optical microscope and all other provided software.
- Comprehensive 12 months warranty should be provided on microscope, camera, desktop and all the provided software.
 - Two years non-comprehensive AMC is required. AMC visit should have two preventive visits and one breakdown visit yearly.
 - In price comparison, AMC and warranty is to be considered.
 - The bidder must provide list of recent buyers of this particular unit (including heating stage) preferably in India.

Note: The specifications mentioned in the quotation should be supported by technical details/ brochure/literature and enclosed with the quotation. Otherwise, it will not be considered technically.