

SUPPLEMENTAL/BID BULLETIN

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ADDENDUM NO. 1

This Supplemental Bid Bulletin No. 1 is being issued to further clarify, modify and amend items, specifications in the Bid Documents to address key issues for the “**PROCUREMENT OF ONE (1) LOT INVERTED METALLURGICAL MICROSCOPE AND ACCESSORIES**”

| TECHNICAL SPECIFICATIONS | |
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| ORIGINAL | REVISION |
| INVERTED METALLURGICAL MICROSCOPE | |
| 1) LED lamp with rheostat... | 1) <u>Easily replaceable</u> LED lamp with rheostat... <u>Inclusion of (2) LED lamps as spare</u> |
| 2) Main body...; Tilting | 2) Main body...; Ergonomics |
| 4) Contrast Imaging (Bright field, Dark field, Polarized light, Differential Interference Contrast (DIC), etc.) | 4) Contrast Imaging (Bright field, Dark field, Polarized light, Differential Interference Contrast (DIC), etc.; <u>preferred that combination is possible e.g., bright field + dark field</u>) |
| 5) Objectives: Plan Apochromatic, 2.5x, 5x, 10x, 20x, 50x, 100x or better | 5) Metallurgical Objectives: Plan Apochromatic, 2.5x, 5x, 10x, 20x, <u>40x</u> , 50x, 100x or better |
| 7) Eyepiece: 10X, with adjustable eyelenses | 7) Eyepiece: 10X, with adjustable/ <u>focusing</u> eyelenses |
| 8) Turret plate magnification factors: 0.8, 1, 1.25, 1.88, preferably with 0.5, 1.5, 2. | 8) Turret plate magnification factors: <u>preferably 0.8, 1, 1.25, 1.88. Open to other values as well</u> |

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| <p>10) Software (Image acquisition): Extended focus- sharp image from several focus positions; for samples with varying height</p> | <p>10) Software (Image acquisition): Extended focus- sharp image from several focus positions; for samples with varying height (<u>feature applicable also especially to images captured from stereomicroscope</u>)</p> |
| <p>10) Software (Image Analysis):</p> <p>IMAGE ANALYSIS</p> <p>Grain size analysis - based on ASTM E112 methodology: chart comparison, linear intercept, circle intercept; grain size distribution using areas</p> <p>Graphite – form, size, etc, compliant with ASTM A247.</p> <p>Coating/ plating thickness – compliant with ASTM B487</p> <p>Inclusion Rating – determines area percentage, mean free path distances, and average numbers of intercepts of oxide and sulfide stringers in ferrous metals in accordance with ASTM E1245</p> | <p>10) Software (Image Analysis):</p> <p>IMAGE ANALYSIS (additional specs):</p> <p>Grain size analysis - based on ASTM E112 methodology: chart comparison, linear intercept, circle intercept, <u>planimetric</u>; grain size distribution using areas</p> <p>Graphite – form, <u>distribution</u>, size, etc, compliant with ASTM A247. <u>Graphite nodularity and content (ASTM E2567), ferrite to pearlite ratio</u></p> <p>Coating/ plating thickness – <u>Measures the layer thickness of single or multiple layers</u></p> <p>Inclusion Rating – determines area percentage, mean free path distances, and average numbers of intercepts of oxide and sulfide stringers in ferrous metals in accordance with ASTM E1245 <u>and ASTM E45</u></p> <p><u>OTHERS</u></p> <p><u>height measurement basing on the top and bottom of particle, capable of showing image with corresponding 3D profile/ height profile measurement</u></p> <p><u>Images, other results, measurement data and statistical analysis can be exported to Microsoft Office.</u></p> <p><u>Note: All Standards mentioned must be the latest available version</u></p> |

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| <p>11) Inserts include but not limited to: necessary sliders, filters, compensators, grain size reticles, micrometer eyepiece reticle, Stage Micrometer, Metal, 1mm/0.01mm with certification</p> | <p>11) Details of:</p> <p>Sliders: <u>dark field slider, bright field- dark field phase contrast kit</u></p> <p>Filters: <u>polarizing kit/ filters</u></p> <p>Reticles: <u>Crossed Scale 10mm 100 Divisions; Cross-Line with Graduations 10mm 100 Divisions; Horizontal Reticle Ruler, 1mm/ 0.01mm graduation; Vertical Reticle Ruler, 1mm/0.01 mm graduation; Austenite Grain Size/ Counting (100X); Brass Grain Counting (100x); Copper Grain Counting (100x); Grain Counting 00-10 ASTM E112 (100x); Untwinned Grain Counting 1-10 (100x); Steel Grain Sizing (100x); Grain Counting ASTM E112, line and circle intercept (100x); Grid 1mm x 1mm. 100 squares total (10x10); Reticle Thickness Gauge; Grain Sizing Reticle ASTM E45 Method A, B, C, D and E; Reticle 10 Concentric Circles, 0.1mm-1mm; Reticle Cross Line with 30 degree increments; Reticle Cross Line with 45 degree increments</u></p> <p><u>Inserts enabling polarizing microscopy (e.g., polarizer, analyzer, polarizing condenser, compensator, etc.) and DIC microscopy</u></p> <p><u>Stage Micrometer, Metal, 1mm/0.01mm graduation with certification</u></p> |
| <p>12)Accessories</p> <p>a. Camera - High Dynamic Range (HDR) – adjusts for differences in brightness within an image to reduce glare; -USB 3.0 connection; - Effective pixels: 16 MP; -Pixel Count: 2452 x 2056</p> | <p>12)Accessories</p> <p>a. Camera - High Dynamic Range (HDR) – adjusts for differences in brightness within an image to reduce glare; -USB 3.0 connection; - Effective pixels: <u>16 MP minimum; -(Pixel Count requirement removed)</u></p> <p><u>Preferred that the microscope (hardware), software and camera are of the same brand</u></p> <p><u>Includes:</u></p> <ol style="list-style-type: none"> 1) <u>Microscope cleaning kit</u> 2) <u>Microscope dust cover</u> |

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| <p>c. Printer: Print/Scan/Copy; Continuous Ink; excellent for image printing</p> | <p>c. Printer: Print/Scan/Copy; Continuous Ink; excellent for image printing; <u>Scanning and printing area can accommodate legal size paper (8.5"x14")</u></p> |
| <p>d. Workstation- Laboratory table, 2 chairs, filing cabinet; stainless steel material</p> | <p>d. Workstation <u>(1 unit) Laboratory table, 5ft (L) x 3ft (W) x 3 ft (H), with bottom shelf, with leveling feet. Made of stainless steel;</u> <u>(2 units) laboratory benches or stools, stainless steel frame, adjustable seat height, with anti-slip base, padded black leather seat, footrest or foot ring, adjustable lumbar support;</u> <u>(1 unit) chair, stainless steel frame, adjustable height, adjustable backrest, back tilt, padded black leather, with arm rests, with rollers;</u> <u>(1 unit) filing cabinet, 3ft (L) x 1.5ft (W) x 5ft (H), containing 5 drawers, stainless steel material</u></p> |
| <p>e. Stereomicroscope- Trinocular body tube with built in access for camera adapter, camera; LED illumination with rheostat/ brightness control mechanism: epi coaxial, ringlight/ annular with segmenting, flexible light pipe; Double/Multiple nosepiece accessory for quick rotation between multiple objectives; Minimum of 8:1 zoom ratio; Total Magnification range: 5x, 10x, 20x, 50x, 100x or better; 10x eyepiece; With camera for image viewing, analysis and capturing plugged through USB with easy viewing; Manual Focus; Maximum specimen height: 100mm</p> | <p>e. Stereomicroscope- Trinocular body tube with built in access for camera adapter, camera; LED illumination with rheostat/ brightness control mechanism: epi coaxial, ringlight/ annular with segmenting, flexible light pipe; Double/Multiple nosepiece accessory for quick rotation between multiple objectives; Minimum of 8:1 zoom ratio; Total Magnification range: 5x, 10x, 20x, 50x, 100x or better; 10x eyepiece; With camera for image viewing, analysis and capturing plugged through USB with easy viewing, <u>5 MP minimum</u>; Manual Focus; Maximum specimen height: 100mm; <u>heavy duty swing arm microscope stand</u></p> <p><u>Includes:</u></p> <ol style="list-style-type: none"> 1) <u>Microscope cleaning kit</u> 2) <u>Microscope dust cover</u> |
| <p>f. Compatible Uninterrupted Power Supply/ Battery Pack and Voltage stabilizer system- Input: 220V-240V, 50/60Hz.</p> | <p>f. Compatible Uninterrupted Power Supply/ Battery Pack and Voltage stabilizer system- Input: 220V-240V, 50/60Hz; <u>good for 30 minutes.</u></p> |

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| g. Automatic Grinder and Polisher Machine- dual wheel; 12 inches platen diameter; total of 8 platens; Variable Speed Head(0-100 rpm or better); Variable Speed Wheels (100-500 rpm or better); Power Head Force of up to 200N or better; Timed Grinding & Polishing Cycles; Easy to use controls; Provision for water as coolant; Various specimen holders including a holder for 4-6 pieces of 1 inch mounts | g. <u>Manual. Grinder and Polisher Machine- dual wheel; 12 inches platen diameter; total of 8 platens; Platen Wheel Speed up to 500rpm or better; Easy to use controls; Provision of tubing/line for water as coolant; With splash guard</u> |
| General Instructions: | |
| 2) Supplier shall provide a Certificate of Warranty granting two (2) years factory warranty for parts and repairs. | 2) Supplier shall provide a Certificate of Warranty granting <u>one (1) year</u> factory warranty for parts and repairs. |

This shall form an integral part of the Bidding Documents for the “**PROCUREMENT OF ONE (1) LOT INVERTED METALLURGICAL MICROSCOPE AND ACCESSORIES**”

For the guidance and information of all concerned.

Sgd.
MS. AUREA T. MOTAS
 BAC Chairman
 Metals Industry Research and Development Center