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Technical Specification : Microscope-mounted Cold Cathode Discharge Optical Cathodoluminescence (CL) Petrography System with Camera and Software – 1 Set

Sr. No	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	Cathodoluminescence (CL) system should be microscope-mounted. It should be used as stand-alone chamber for macroscopic observations using a separate support stand.		
2.	The system should have provision to accept sample in the form of thin section, thick section and loose grains.		
3.	The system should have storage stand with mounting / adapter plate		
4.	The metallic vacuum components of the system must be made from stainless steel throughout.		
5.	All fixed vacuum seals should be of “O ring” type		
6.	All movable vacuum seals should be made from Teflon or Viton.		
7.	Movable parts should be mounted on single piece to easy access while servicing / repairing/ sending company to repair.		
8.	Cathodoluminescence source should be Cold cathode discharge type Electron gun.		
9.	Voltage of electron gun should be varying between 5 kV and 10 kV and should not exceed 15 kV.		
10.	The beam current should be regulated and varying between 0 and 1 mA.		
11.	The discharge tube seals should be easily replaceable with standard “O rings”.		

12.	There should be provision to view operation by removing some portion of gun cover.		
13.	Electron beam should be focused up to 1mm spot, should be unfocused from 5mm to 10 mm diameter and defocused beam illuminating from 1 cm size up to 5cm diameter.		
14.	The system should have provision of adjustable beam deflection magnets		
15.	System should be compatible to work with objective lenses having minimum working distance up to 9 mm to 10 mm, which further can be reduced up to 5 mm to 7mm by using re-entrant window.		
16.	Re-entrant top window for observation sample under low working distance high magnification objective lenses. The window should be 3 mm thick and made up of leaded glass disc.		
17.	Sample tray having dimension of 2 inches x 3 inches which can accommodate thin section as well as 7mm thick sample.		
18.	Vacuum pump should be of mechanical type which have fore-line trap and mist eliminator.		
19.	The normal operating modes of the instrument, i.e., pump down, operate (manual), operate (regulated), and External should be front panel switch selected. The instrument should come on to its previous settings, unless the operator overrides them		
20.	There should be provision to select and change spare parts (i.e. spare cathodes, “O rings”, shaft seals, ferrules, etc.) during warranty period.		
21.	Adapter to attach cathodoluminescence vacuum stage with microscope		
22.	Microscope main body/ stand: quantity – 1 no Microscope main body should have following parts. a. fine and coarse focusing nob with focus stopper and torque adjustment, b. attachable LED illuminator source c. Nose piece: Reversed centering quintuple nosepiece should hold 5 number of objective lenses with DIN-compliant compensator slot. d. Berek compensator e. Nose piece spacer		

	f. Column riser to adjust height between objective and sample g. Analyser: 360 degrees rotatable slider analyser h. Large, 175 mm and above, circular, graduated stage, plus Mechanical Stage (dimension 35 mm × 25 mm) i. Stage Clips (2 pcs) j. Condenser: Long working distance achromatic having 27 mm focusing stroke. k. Polarizer: 360 degrees rotatable l. 25 mm GIF filter m. LCB filter n. Attachable diascopic LED lamphouse and its connection cable o. LED controller p. 2-meter-long cable to connect LED controller q. Power cord. r. Adapter to hold cathodoluminescence vacuum stage.		
23.	Microscope trinocular tube with c mount and adapter: quantity – 1 No. a. Trinocular intensity split ratio of double port: 100: 0 or 0: 100 (eyepiece: port) b. C mount adapter with 0.7x NC DS camera relay lens c. Connecter tube to connect camera and trinocular.		
24.	Microscope objective lenses: a. Plan Apochromatic 2X (N.A. 0.10/W.D. 8.5mm) b. Plan Fluor EPI P 5X (N.A. 0.15/W.D. 23.5mm) c. Plan Fluor EPI P 10X (N.A. 0.3/W.D. 17.5mm) d. Plan Fluor EPI P ELWD 20x (NA0.40/WD. 19.0mm) e. Plan Fluor EPI P ELWD 50X (N.A. 0.60/W.D. 11.0mm)		
25.	Eyepiece type 1: quantity 1 No. 10x having FOV 22mm with crosshair, micro meter and Diopter Adjustment		

26.	Eyepiece type 2: quantity 1 No. 10x having FOV 22mm with Diopter Adjustment		
27.	Microscope intermediate tube: a. Tube should have slot for analyser, Bertrand lens and standard DIN compensator. b. Rotatable slider type analyser is required. c. Focusable and centerable Bertrand lens is required. d. Quartz Wedge is required. e. Lambda plate and Tint plate is required. f. Senarmont compensator is required. g. 546 filter for measurement of retardation is Required.		
28.	Episcopic illumination Setup. a. It should have one episcopic illumination tube which can connect between main body and intermediate tube b. Attachable episcopic LED lamphouse and its connection cable c. Power supply, its power cord and connection cable d. Polarizer: 360 degrees rotatable slider polarizer is required. e. Analyser is required f. ND filter slider is required. g. LCB filter slider is required. h. NCB filter slider is required. i. DIC slider is required. j. Lambda plate is required. k. Excitation balancer is required. l. GIF filter is required.		
29.	Camera with software and system a. High-definition microscope Camera equipped with more than a 5-megapixel CMOS image sensor. b. Camera to PC connection wire having compatibility with USB 3.0 port c. Basic camera bundle software d. Extra HDR compatible camera software module. e. Live comparison software module. f. Suitable/ compatible Computer system with 32” monitor and it’s all accessories.		

30.	Microscope dust covers: quantity - 1		
31.	Two additional set of all “O rings”, shaft seals and ferrules should be provided.		
32.	Sample Holder for Loose Grains should be provided.		
33.	Textbook with12 color plates on “Cathodoluminescence of Geological materials “written by Dr. Donald Marshall.		
34.	Four (4) nos. of nosepiece adapter for connecting EPI objective should be provided.		
35.	Two (2) nos. of nosepiece adapter for connecting CN objective should be provided.		
36.	Instruction manual for microscope as well as cathodoluminescence system which includes full set of operational information, a discussion of basic CL theory and practice, servicing details for all user-serviceable components, schematics, etc must be provided.		
37.	On-site installation and user training by company personnel should be provided.		
38.	Minimum two years of comprehensive warranty		
39.	Demonstration of the product need to be arranged on user’s request		