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# INSTRUMENT STANDARD OPERATING PROCEDURE MANUAL

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College of Medicine



SAFETY AND LABORATORY COOMMITTEE, C.O.M, K.F.U.

**Prepared by**

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**Document History**

Document Section	Details of Amendments	Date	Modified by (Initials)
SOP	First Draft on SOP for the operation of AUTOMATED CRITICAL POINT DRYER ( Leica EM CPD 300 )		

## 1. OBJECTIVE

- ☐ The document describes the operation of **AUTOMATED CRITICAL POINT DRYER (Leica EM CPD 300)**.
- ☐ Scanning samples for SEM imaging need to be dried in order to be compatible with the vacuum in the SEM microscope column and requires preservation of surface details of the specimen.

## 2. SCOPE

- ☐ Closed Full reproducible controlled processes through full automated software (**Cut off point 45C**)
- ☐ Program screen.
- ☐ Holder panel \ Filler
- ☐ Application protocols for biological specimens as **Bacteria, Fungi ,RBCs ,pollens, animal and plant tissues and insects...**etc.
- ☐ CO2 pressure bottle temperature 18-25C (52-61 bar) –humidity 5-90%.
- ☐ Pressure vessel 150 bar.
- ☐ Maximum operating pressure 79 bar.
- ☐ Cooling capacity 90 W at -5 C (2500 l\ MIN).
- ☐ Cooling range 5C to 25C
- ☐ Heating range 33C to 43C.
- ☐ **EM TP sample basket stem** which fits directly to **Leica EM CPD 300** holder.

## 3. RESPONSIBILITIES

- ☐ It is the responsibility of designated personnel in the lab to train staff and students on this procedure and to ensure adherence to this procedure under supervision.
- ☐ It is the responsibility of designated personnel (staff or Student) to follow the instructions of this procedure under supervision.

## 4. REFERENCES

- ☐ **Leica EM CPD 300** operating manual .
- ☐ **Leica EM CPD 300** Technical Data Sheet.
- ☐ **Leica EM CPD 300** Application booklet.

## 5. DEFINITIONS

- ☐ **Leica EM CPD 300** basic unit Closed fully automated controlled programming software (80 bar), pressure vessel 150 bar..
- ☐ Large variety sample holders with appropriate filter
- ☐ Process chamber with sample container and sample holder.
- ☐ Sample container with quick release pin.
- ☐ Filter disc and porous pot holder with 4 wells (15x21 mm, mesh size 0.5 mm).
- ☐ Fine Mesh specimen holder for 4 fine Mesh Specimen Baskets (mesh size 0.5 mm)
- ☐ Cover slip holder
- ☐ Grid holder with 32 numbered slots.
- ☐ TP stem holder of **Leica EM CPD 300**.
- ☐ TP Baskets.
- ☐ Wafer holder for 4x2 inch wafers.
- ☐ **Waste bottle for liquids disposable**  
( eg : Ethanol, Acetone etc.).
- ☐ **Timer.**

## 6. SAFETY PRECAUTIONS

- ☐ Careful when handling flammable liquids (e.g. Acetone and Ethanol).
- ☐ Clean all surfaces by aqueous reagents or 60% ethanol and a clean cloth.

### 6.1. PROCEDURE FOR OPERATING AUTOMATED CRITICAL POINT DRYER ( Leica EM CPD 300 ).

#### 6.2. Turning on the instrument:

- Turning on the power supply
- Choose the program name (e.g. 1 ,2, 3 etc.) from the prestored programs.
- **START THE PROGRAM.**
- The main touch screen show the main steps of the ongoing program:

#### 6.3. Software Operation.

**Leica EM CPD 300** Technical Data Sheet collection sheet

#### 6.4. Steps of the Procedure

- ☐ Applied the samples into pressure chamber of CDP and cover them with exchange fluid to prevent air drying.
- ☐ Liquid CO<sub>2</sub> filled into pre-cooled pressure chamber and new CO<sub>2</sub> is filled (purging cycle) .
- ☐ After appropriate purging cycle all exchange fluid should be replaced by liquid CO<sub>2</sub>.
- ☐ Then Starts heating process and the heating process generates supercritical CO<sub>2</sub>.
- ☐ The superficial CO<sub>2</sub> then forms to gaseous CO<sub>2</sub> at the CO<sub>2</sub> critical point temperature and pressure (Tc 31 C and Pc 74 bar)

By maintaining the temperature constant at 31 C. and opening the gas out valve which reduces the pressure in the chamber..

- ☐ Ethanol (Pc 60 bar\ Tc 241 C.) and Acetone (Pc 46 bar \Tc 235 C.).

#### 6.5. Turning off the Instrument

END OF PROGRAM

- ☐ Turn off the software.
- ☐ Turn off the electric main power source.
- ☐ Remove the samples
- ☐ Start the next step Leica EM Sputter Coater family

#### Note:

 **The SPECIMEN DURING PROCESSING MUST BE ALWAYS COVERED WITH LIQUIDS TO AVOID DRYING .**

#### 6.6. Warning

**Write any the warning in BOLD and RED FONT.**



