

# PIPS691 Gatan Operation Manual

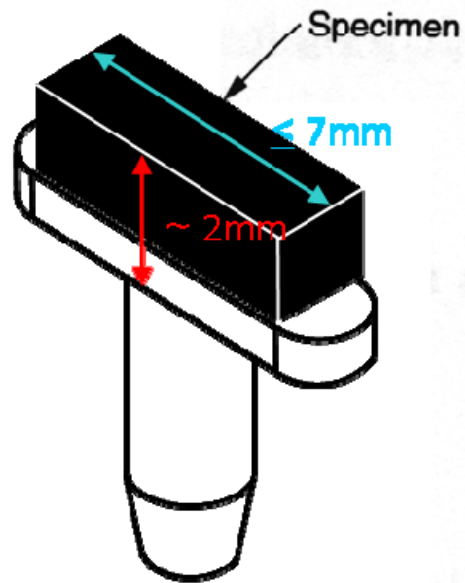
## Note:

The chamber pressure is  $< 10^{-4}$  Torr.  
The rotation control is in the ON position.  
The main tap of Ar gas is open.

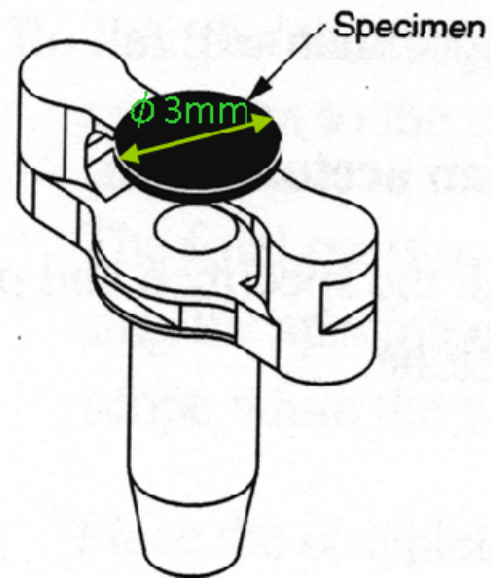
# 1. Sample Mounting

After pre-thinning by mechanical polishing, the sample disc will be mounted on a PIPS sample holder (DuoPost).

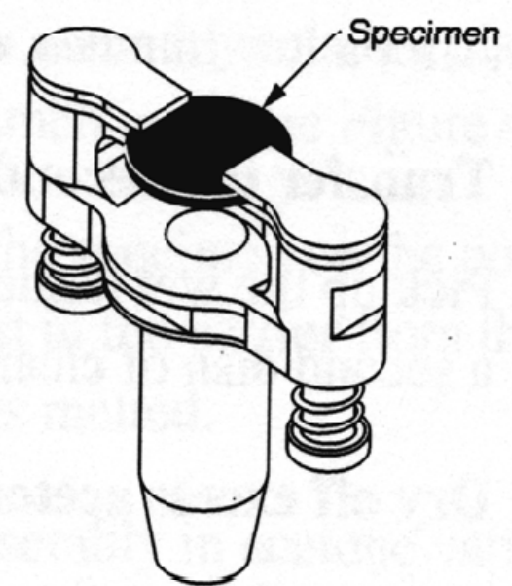
The sample should be located in the center of the clamp.



**For SEM/EBSD**



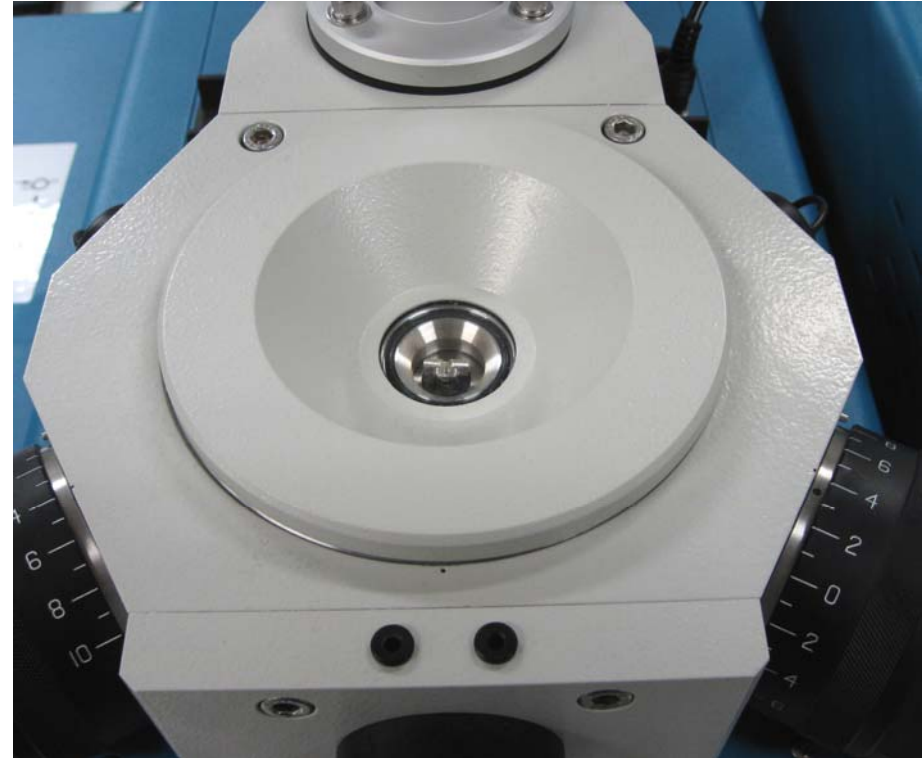
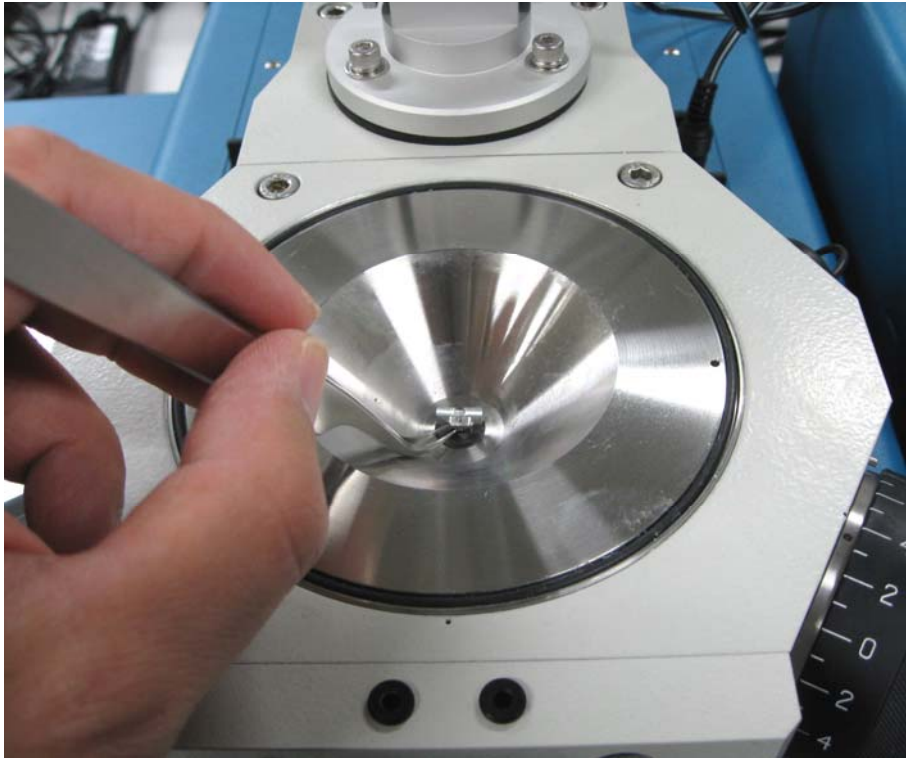
**For TEM  
(glue-type)**



**For TEM  
(clamp-type)**

## 2. DuoPost into the airlock chamber

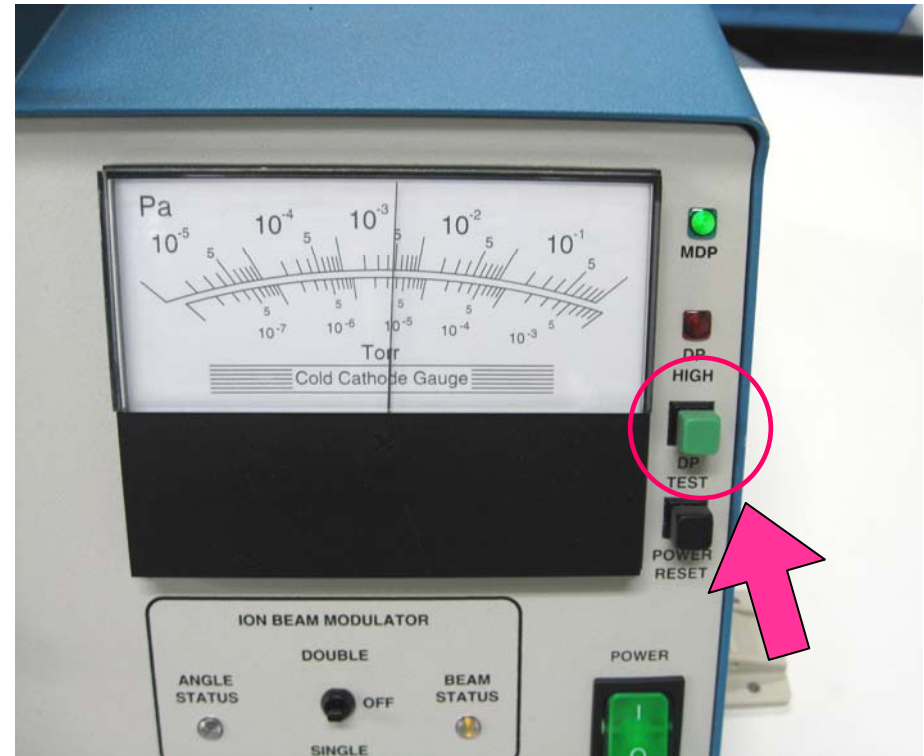
Place the DuoPost into the airlock chamber.  
Replace the airlock cover.



### 3. Monitoring the airlock chamber vacuum pressure

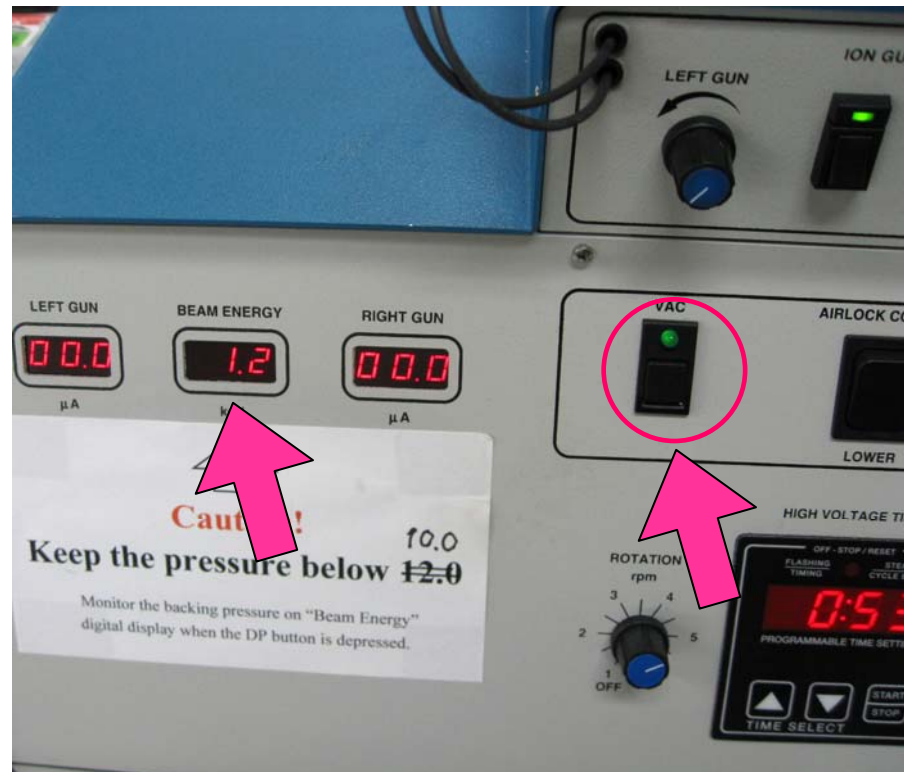
Monitor the backing vacuum pressure of the airlock chamber by the pressing the [ DP TEST ] button.

The pressure is displayed on the Beam Energy digital display (center display).



## 4. Vacuum drawing the airlock chamber

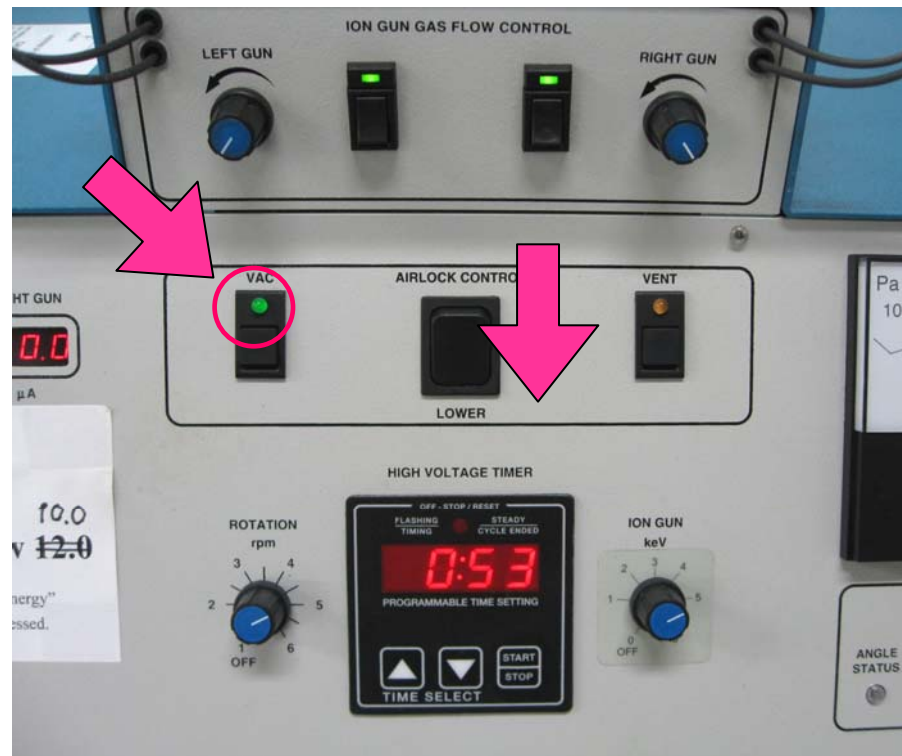
Press the [ VAC ] button not exceeding 10.0 of vacuum pressure.  
**Instantly, press and release** the button in an initial rough pumping.



## 5. Loading the DuoPost into the airlock chamber

The airlock chamber pressure reaches the preset level, the green VAC light will illuminate.

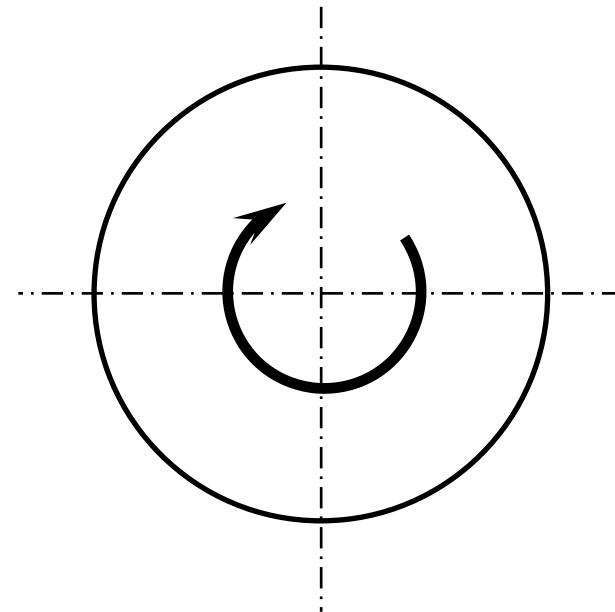
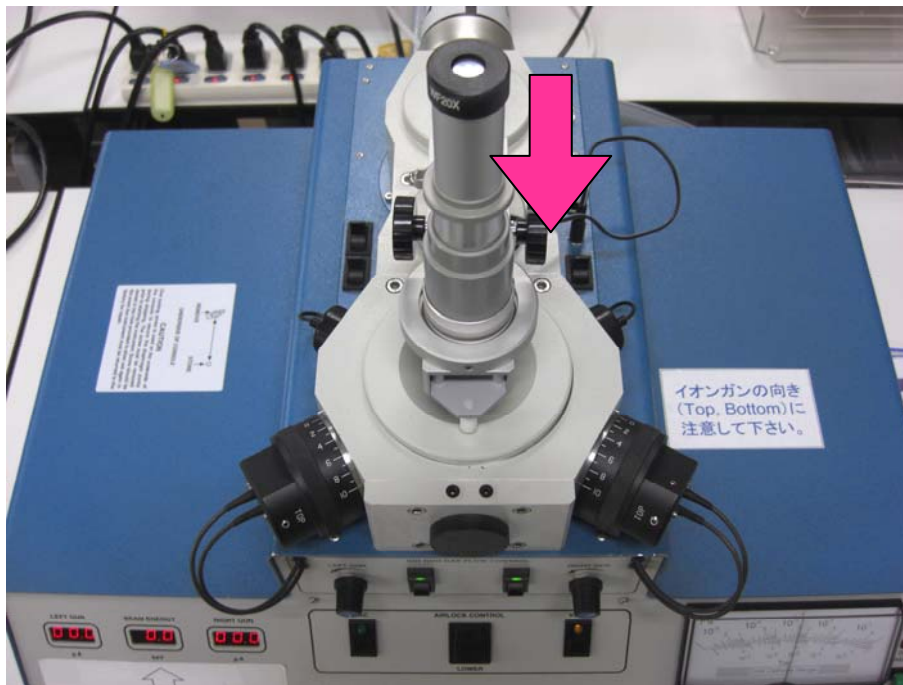
Press the airlock control switch to [ lower ] the specimen mount.



## 6. Confirmation of center position

Confirmation of the rotation center position.

If the center position is shift, start from the 1. sample mounting to do it all over again.



## 7. Set the ion-sputtering condition

Adjust the acceleration voltage and the incident ion-beam angle.

Standard condition:

Voltage 3.5 – 5 keV  
Angle 2 – 4 degree





## 8. Start the ion-sputtering

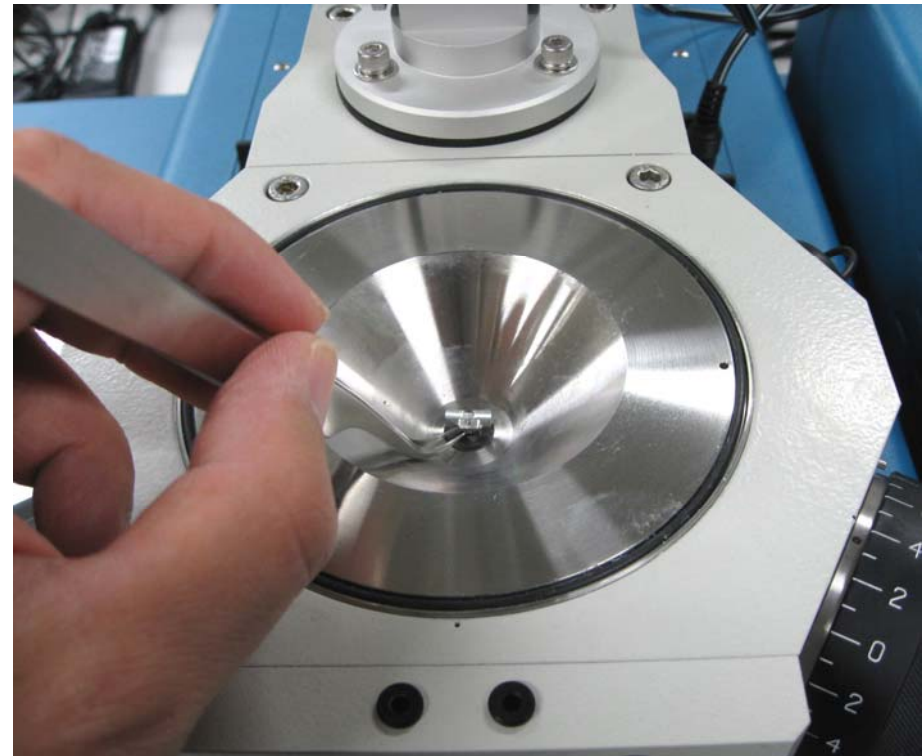
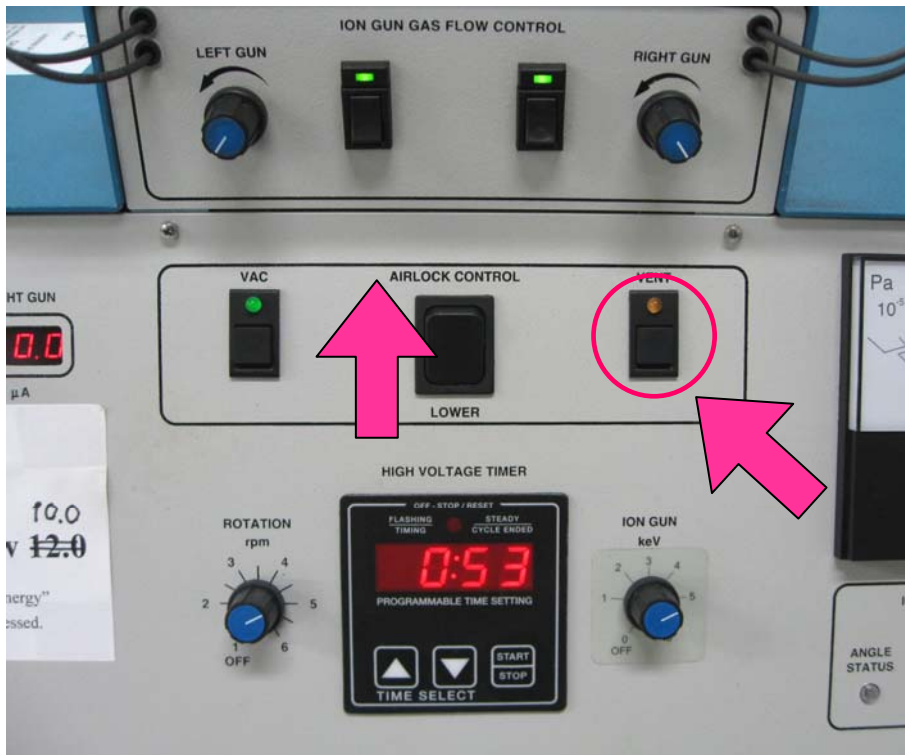
Set the time intervals and press the [ Start / Stop ] button.



## 9. Unloading the DuoPpst

Press the upper part of the [ airlock control ] switch, which will raise the sample mount up to the airlock chamber.

After **10 sec.**, Press the [ VENT ] button to vent the airlock chamber.



# Preparation for microscopy (SEM, EBSD)

## Preparation Method

- wet-etching

Advantage : Restraint of formation of damage/affected layer on surface

Disadvantage: Complicated wet-etching conditions (Solutions, time and temperature..)  
Huge difference in etching speed for microstructures and materials

- mechanical polishing

Advantage : Simple method and equipments

Disadvantage: Formation of damage/affected layer on surface

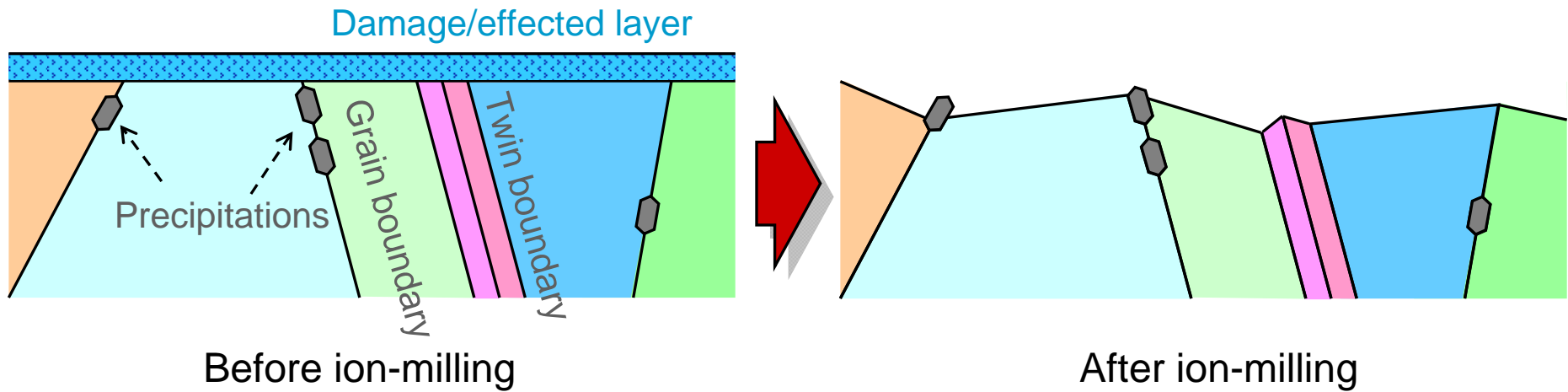
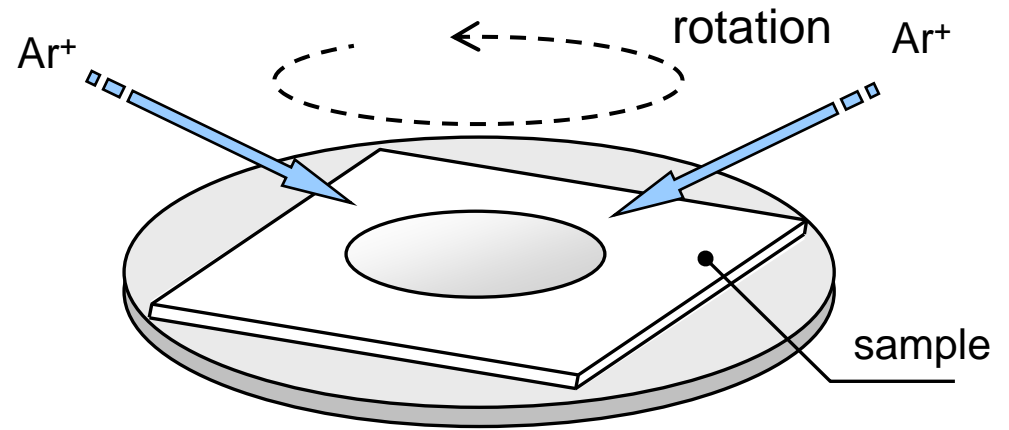
- ion-milling

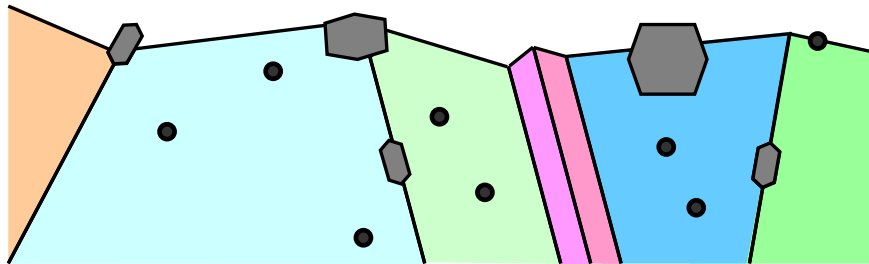
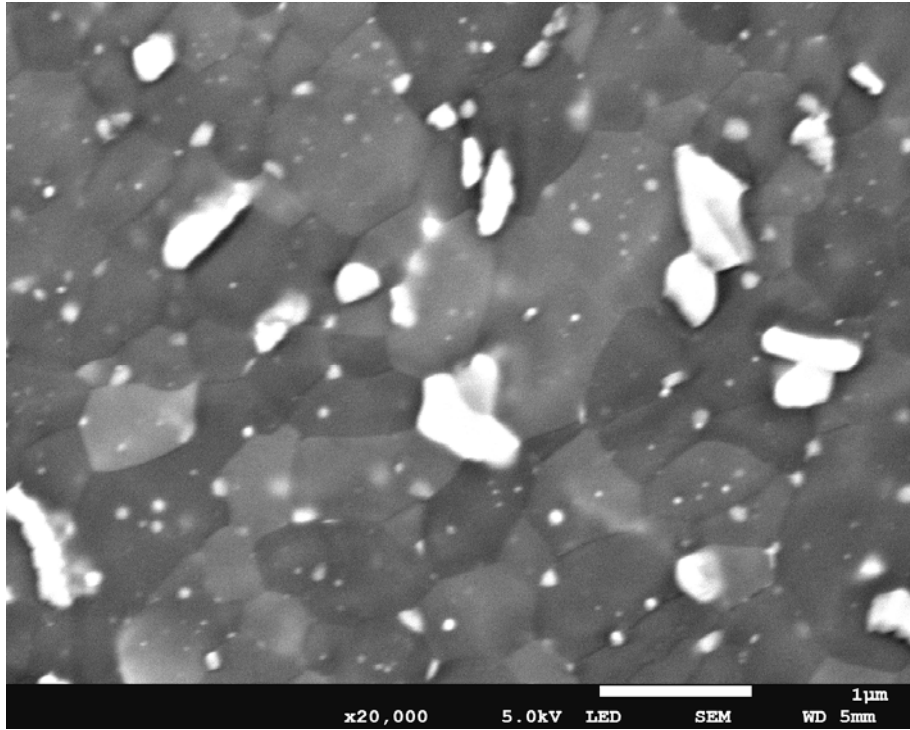
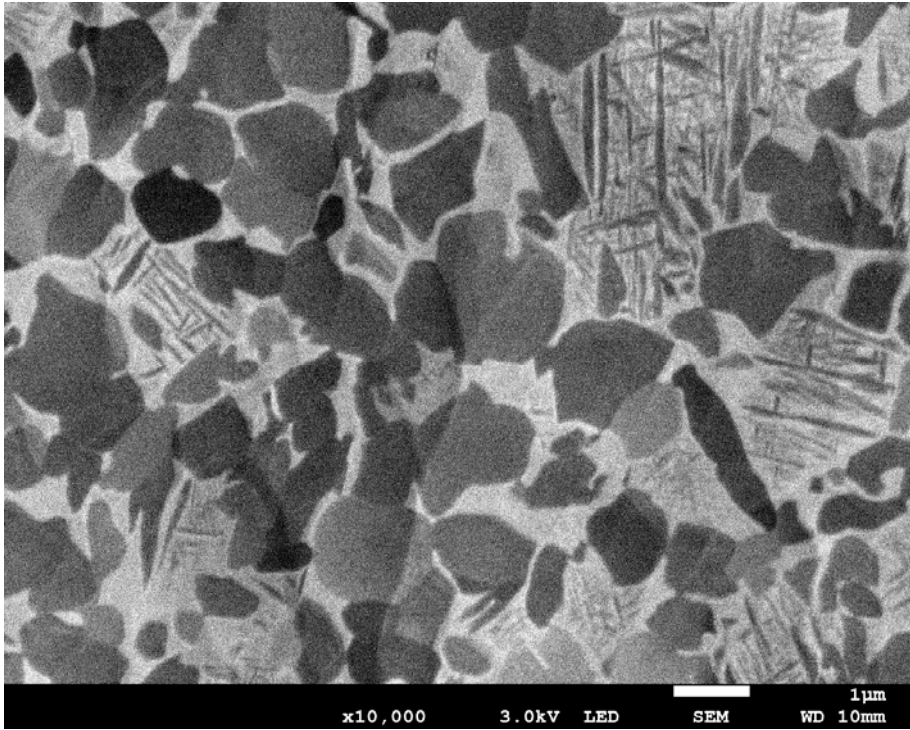
Advantage : Without any damage/affected layer on surface

Regular milling speed for all microstructures and materials

Disadvantage: Expensive equipment

# Ion-milling





After ion-milling