

UT GeoMechanics Lab

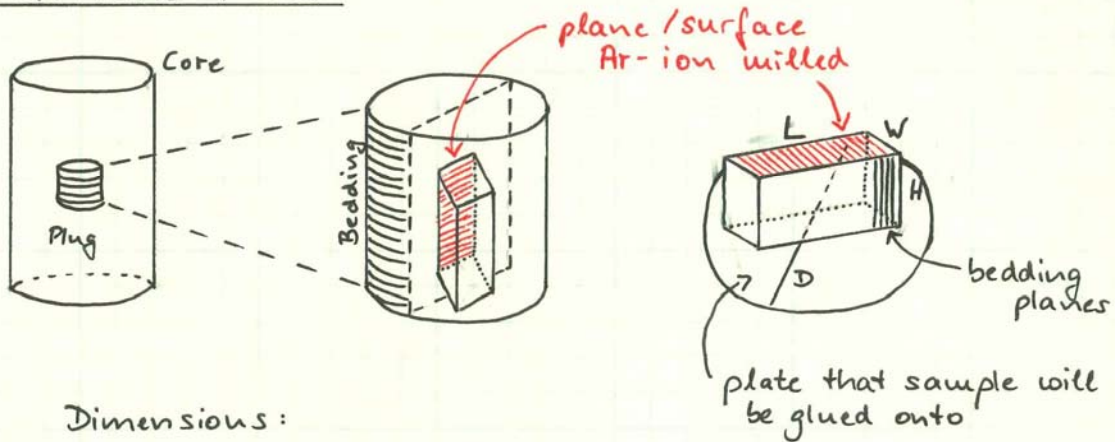
Scanning Electron Microscopy - Sample Preparation Procedure

This procedure describes how to prepare samples (both resedimented samples and hard rocks like Barnett Shale) for Scanning Electron Microscopy (SEM) in the SEM lab at BEG. SEM lab manager is Patrick Smith.

Preparation of sample for SEM imaging

1. Gather the plug or hockey puck or piece of material that needs to be prepared for SEM imaging.
2. Orient it relative to bedding as shown in Figures 1 and 2.
3. Sketch out on the sample where to saw/cut it keeping in mind the required dimensions for the sample [length (L) = 10mm, height (H) = 5 mm, and width (W) = 5 mm].
 - a. **If it is a resedimented sample...**
 - i. Use a wire saw to cut the sample to required dimensions with slow, easy, and careful strokes (do not press too hard). It is suggested to use a wooden block underneath the part of the sample that is not being sawed off.
 - ii. Make sure that all surfaces are in a 90° angle to each other; especially that the bottom surface (where the sample is glued onto a plate) and the top surface are parallel to each other.
 - iii. Use fine sand paper to manually finish off all surfaces. Move the sample in back-and-forth motions across the sand paper (not in circles); if possible along the bedding planes (i.e., bedding planes and strokes on sand paper are parallel).
 - b. **If it is a hard rock sample** (like the Barnett shale)...
 - i. Use the wheel saw in the Core Processing and Saw Room in Bldg. 131 to cut the sample to the required dimensions leaving some extra space on all sides.
Note: Make sure you have received the Quality Assurance & Safety Training by Nathan Ivicic before handling any device in the Core Processing and Saw Room.
 - ii. Use the belt sander in the Core Processing and Saw Room to coarsely sand the sample to the required dimensions.
 - iii. Make sure that all surfaces are in a 90° angle to each other; especially that the bottom surface (where the sample is glued onto a plate) and the top surface are parallel to each other.
 - iv. Use fine sand paper to manually finish off all surfaces. Move the sample in back-and-forth motions across the sand paper (not in circles); if possible along the bedding planes (i.e., bedding planes and strokes on sand paper are parallel).

VERTICAL PLUG :

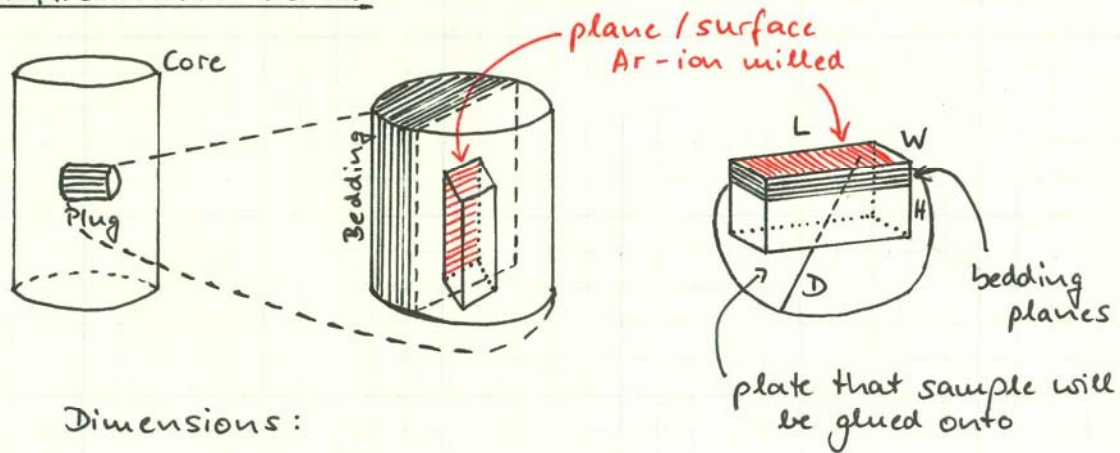


Dimensions :

- L = 10 mm
- W = 5 mm
- H = 5 mm
- D = 18 mm

Figure 1: Sketch illustrating preparation of samples for SEM imaging of plane perpendicular to bedding.

HORIZONTAL PLUG :



Dimensions :

- L = 10 mm
- W = 5 mm
- H = 5 mm
- D = 18 mm

Figure 2: Sketch illustrating preparation of samples for SEM imaging of plane parallel to bedding.