# AVS Quick Start Guide

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*The Giesa FL2 Frame and blade component of the Automated Vane Shear (AVS) equipment.*

## Introduction

## Automated Vane Shear (AVS) Test

The AVS test is used for in situ determination of the undrained strength of intact, fully saturated clays (undrained strengths < 100 kN/m2); the test is not suitable for other types of soil or if the clay contains sand or silt laminations.

A four-bladed vane is inserted into the split core and rotated at a constant rate to determine the torque required to cause a cylindrical surface (with a diameter equal to the overall width of the vane) to be sheared by the vane. This destructive measurement is done in the working half, with the rotation axis parallel to the bedding plane. The torque required to shear the sediment along the vertical and horizontal edges of the vane is a relatively direct measure of the shear strength. Typical sampling rates are one per core section until the sediment becomes too firm for insertion of the vane.

The rate of rotation of the vane should be within the range of 6°–12°/min.

The GeoLab software that controls the AVS calculates shear stress as :

$$\text{Stress (kN/m2)} = \text{torque (Nm)} \times \text{Vane constant (1/m3)} \times 1/1000$$

## Set up the software to run samples

| | |
|---|---|
| 1. | Click on the **GeoLab** Icon on the Desktop to start the **GeoLAB** application (*Figure 1*). |
| 2. | Start a new project for each site: **Project > new > project > Expedition_SiteHole** (*Figure 2*). |
| 3. | Start a new test in the project folder: **Project > new > test > CoreTypeSection_Offset** or **TextID_Offset**. |
| 4. | Keep the subdirectory highlighted, and click on **EXCEL** from within the application (*Figure 2*). |
| 5. | Select the Excel template (e.g., *AVS_master_XXXX.xls*) (*Figure 3*). The PP technician will select and save a master file for each particular expedition. |
| 6. | Check the rotation **speed** (1–1.5) and **vane type** (A, drop-down list) *(Figure 4)*. |



*Figure 1. GeoLab Icon.*
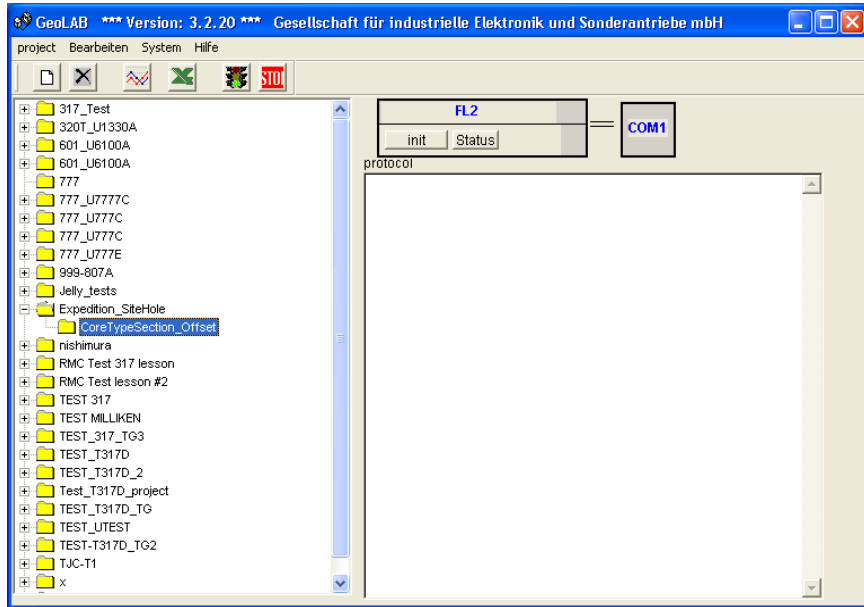
*Figure 2. New Project.*


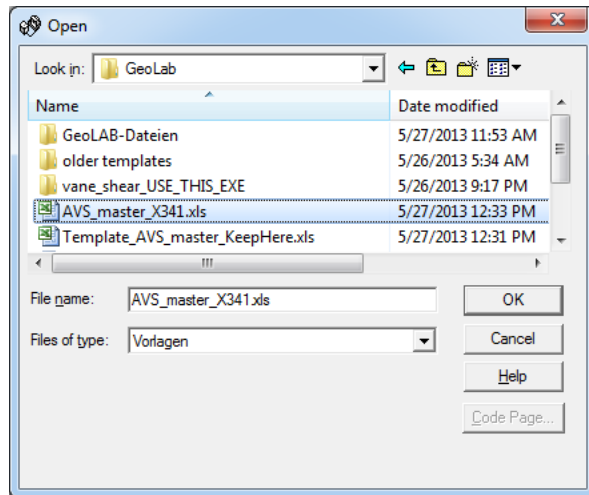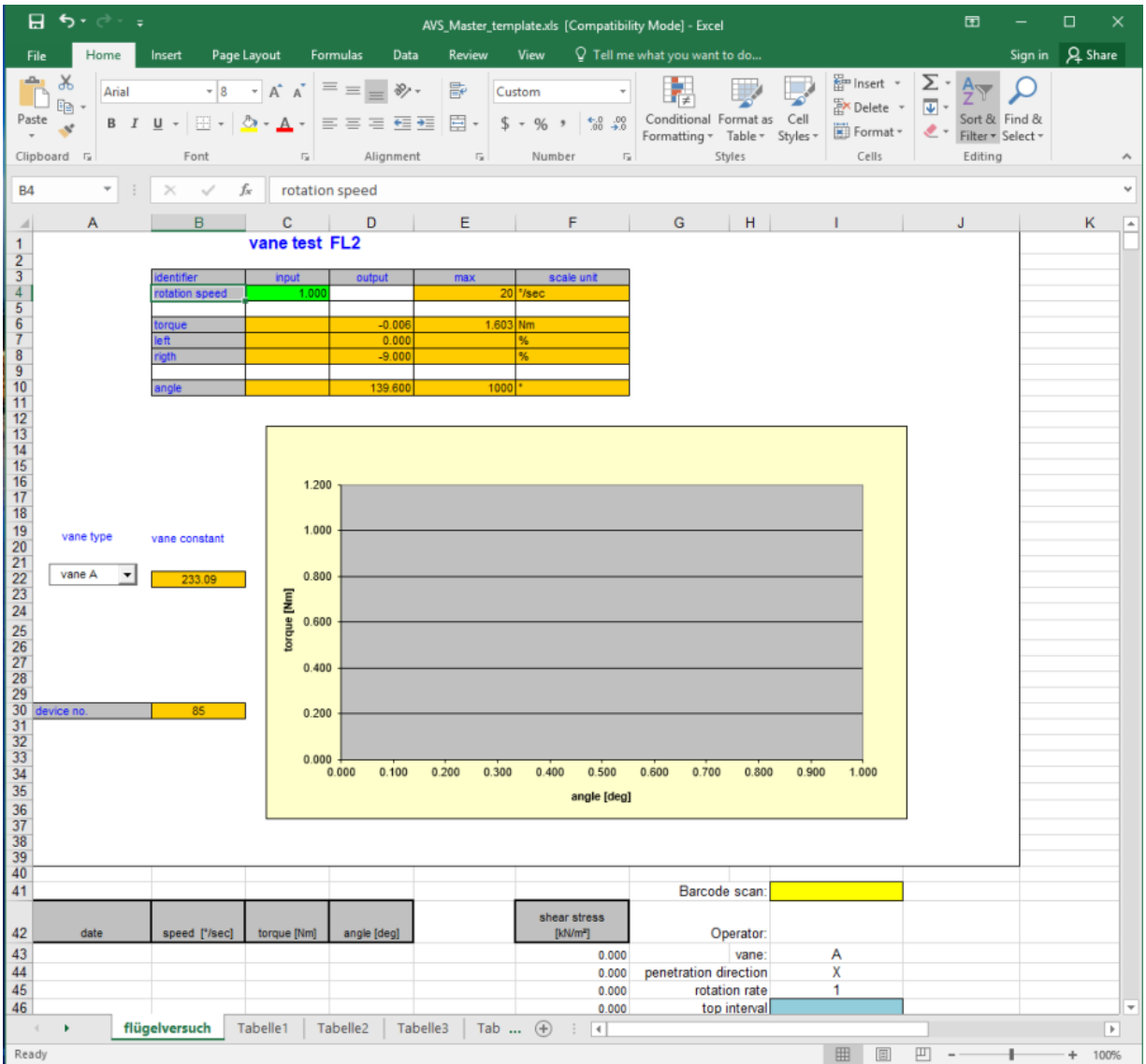
*Figure 3. Excel Templates.*

*Figure 4. Rotation Speed and Vane Type.*

# Run the sample measurement

| | |
|---|---|
| 1. | Insert the vane into the sediment, by turning the black handle clockwise, until the top of the wings are even with the sediment surface. Avoid obviously disturbed areas (cracks, gaps, bioturbation, etc.) and note that the test is not suitable for sand or gravel-sized material or for clay that contains sand or silt laminations.<br>**IMPORTANT! If the brass fitting pushes out of the support beam below the hand crank, the sediment is too hard for this test. Do not attempt to force the vane into the sediment as you may damage the instrument!** |
| 2. | Open the Excel spreadsheet from within **GeoLAB** by clicking on the **Excel** icon. |
| 3. | Use the barcode gun to scan the section information into the yellow cell below the graph. Be sure to cut everything past the textID (e.g., TEST-U341PA…) and paste into an adjacent cell (*Figure 7*). |
| 4. | Measure and enter the offset from top of section (blue cap) into the **top interval** field (light blue box), then click **Enter**. |
| 5. | Modify this information for each core measured. |
| 6. | With GeoLAB already open, Click on *init;* set **sample-time** to 1 or 2 readings/sec (i.e., sampling rate); and click the **traffic light** icon to start the measurement (*Figure 5a*). Monitor the test curve on the Excel screen (*Figure 6*). When the maximum shear strength of the sediment (highest point of the curve) has been reached, stop the test by clicking the **STOP sign** icon in the **GeoLAB** application (*Figure 5b*). |
| 7. | Save the Excel template with its data as a *.CSV (comma delimited)* file using **Save As…:** Path = *C:\data\gantry\in;* **Filename = *LabelID_offset_AVS.csv.*** |

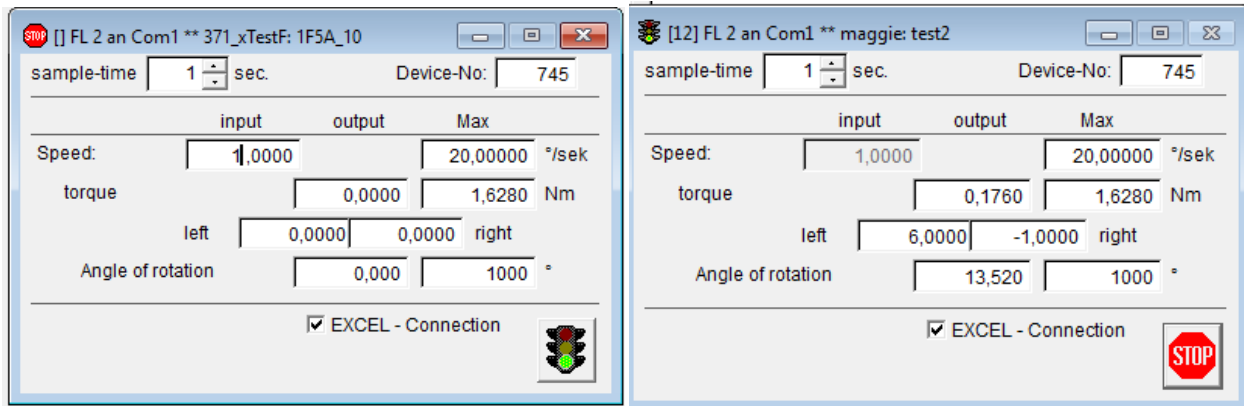| 8. | Close the **EXCEL** application, without saving it again, (LIMS will not upload the file if it is in use). |
|---|---|



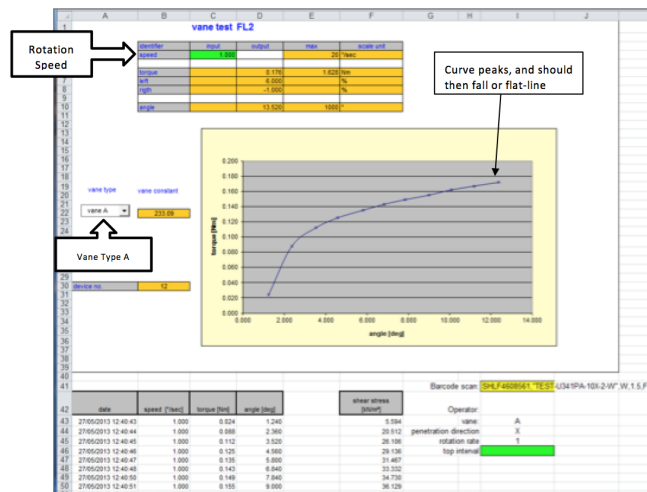Figure 5a. Set Acquisition Parameters.        Figure 5b (click stop sign after the measurement).



Figure 6. Monitor Acquisition.



Figure 7. Paste Barcode TEXT_ID (make sure to segregate the TEXT_ID and Label_ID so it will upload properly).

# Upload data to LIMS

| 1. | Launch **MegaUploadaTron** (MUT, *Applications Folder: IODP*) if it is not already running. |
|---|---|
| 2. | Check to see if the AVS file(s) are present on the screen. If not, select the proper Upload Directory in the **MUT** application under **File**. |
| 3. | Click on the directory of choice (e.g., *C:/gantry/IN*) and check the MUT dialog window. The files to be uploaded should be present in this window. |
| 4. | Select the files to be uploaded, or use the **Select All** checkbox in the lower left corner of **MUT**. |
| 5. | Click the **Upload** button to load the data into LIMS. Note: MUT will automatically search the *.CSV* data file and select the peak shear value. |

| 6. | Users may also check the **Automatic Upload** checkbox for future uploads without any user intervention required. |
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## Retrieve data from LIMS

| 1. | Go to *LIMS Reports* at http://web.ship.iodp.tamu.edu/LORE/. |
|----|---|
| 2. | Under **Select Report**, choose **Physical Properties** > **Shear Strength Automated Vane (AVS)**. |
| 3. | Under **Select Sample Range**, specify *Expedition*, *Site*, *Hole*, and *Section* data to retrieve. |
| 4. | Click **View data or Download data file** to view data on screen or download a CSV file. |

## Credits

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