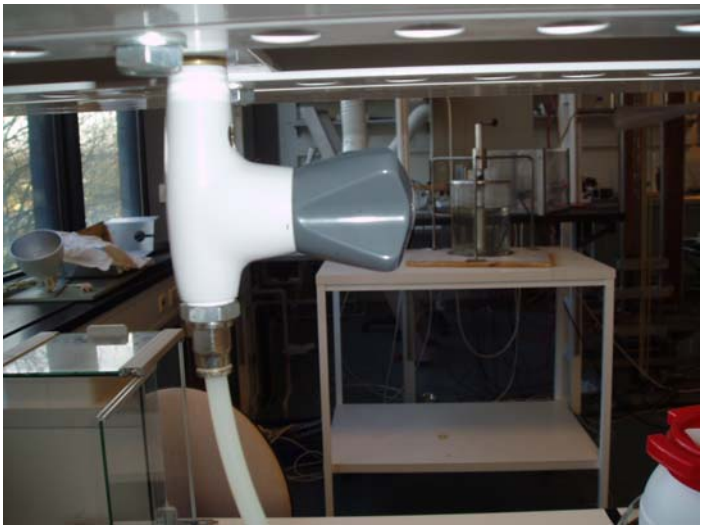
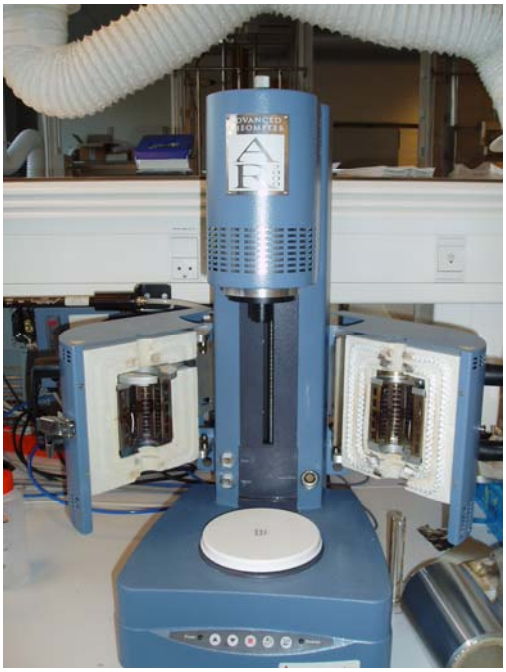
SOP Operation of the TA Instruments AR2000 rheometer.

1) Turn the computer on. Password and login are given.
2) Turn the pressure on so it is above 2 bars.

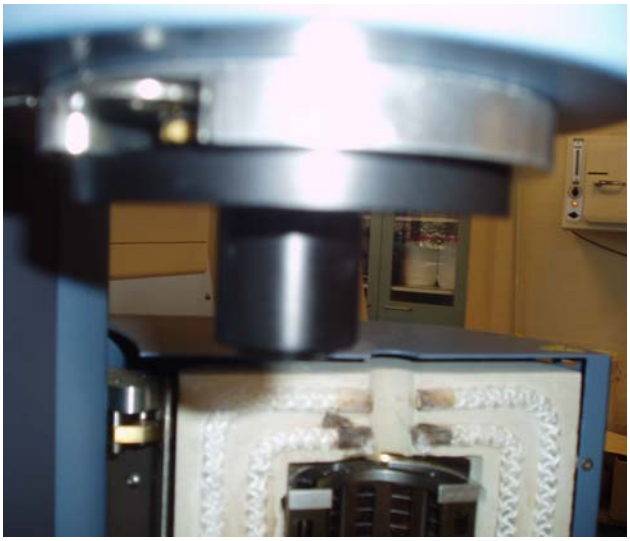


3) Adjust on the black handle if necessary.

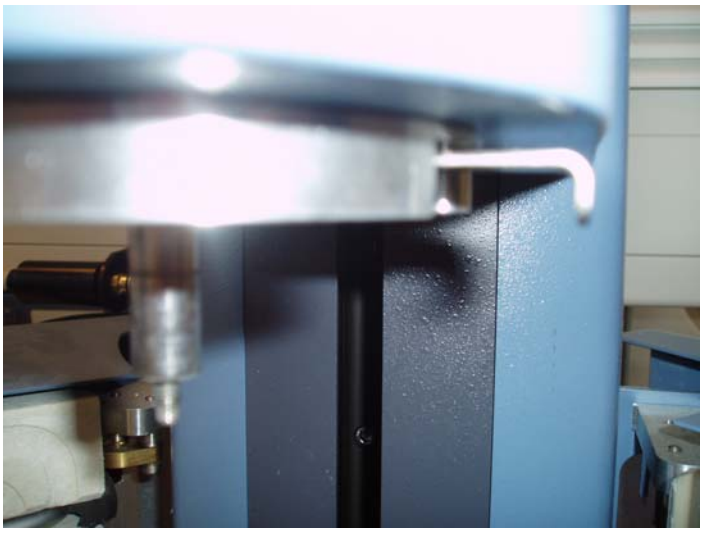
4) Make the rheometer ready by opening the hatches

5) Remove the safety case from the screw by turning the shaft.

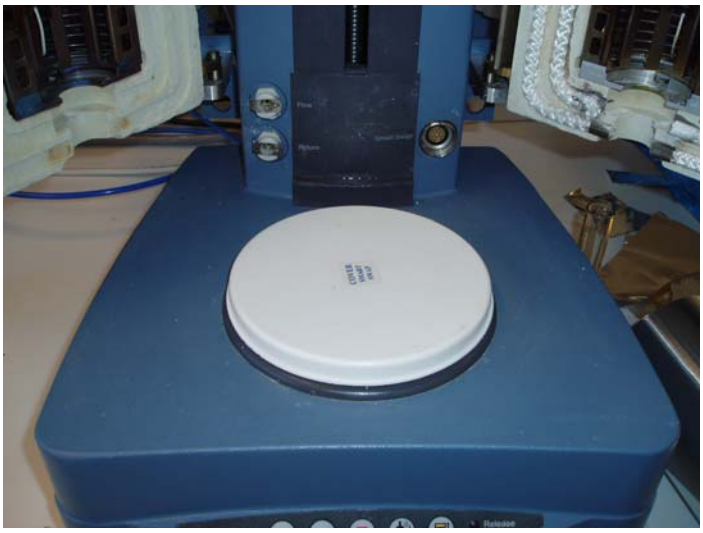



6) Take the spilt out so the bed/bearing is able to turn.



7) Turn the control unit to the rheometer on. The switch is on the back.

8) Remove the cover to the hotplate.



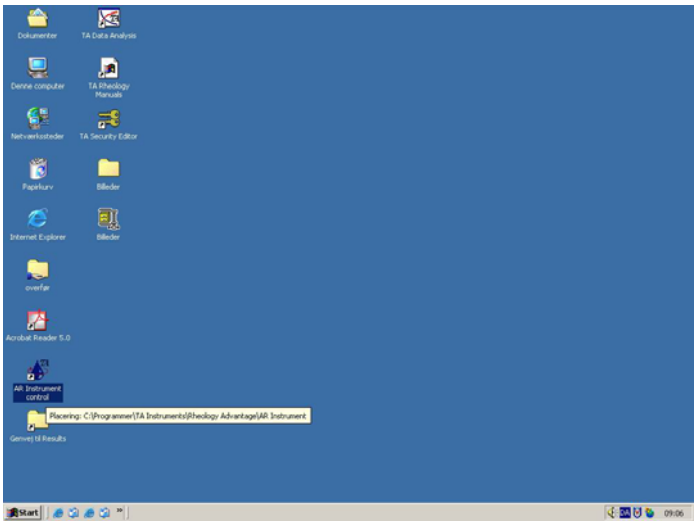
9) The hotplate is magnetic so press the release button. Carefully place the hotplate. Place the wire with the red button upwards.

10) Then stick the wires for the cooling water in their outlets and turn on the cooling water.

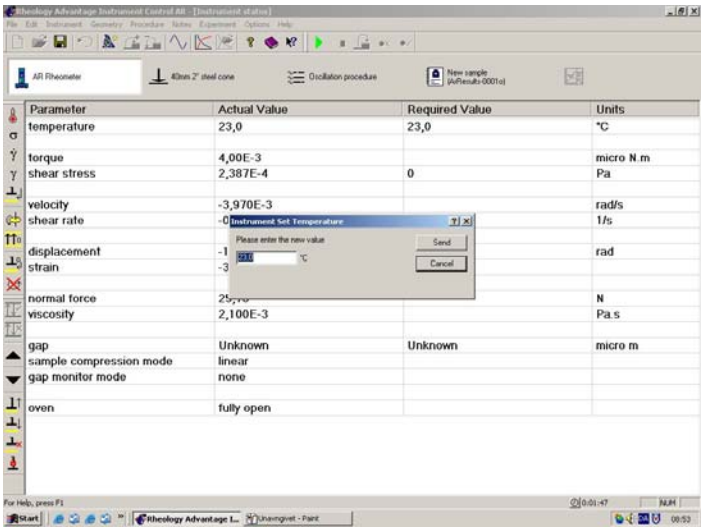
This has to run slowly.

11) Choose geometry and screw this on carefully.

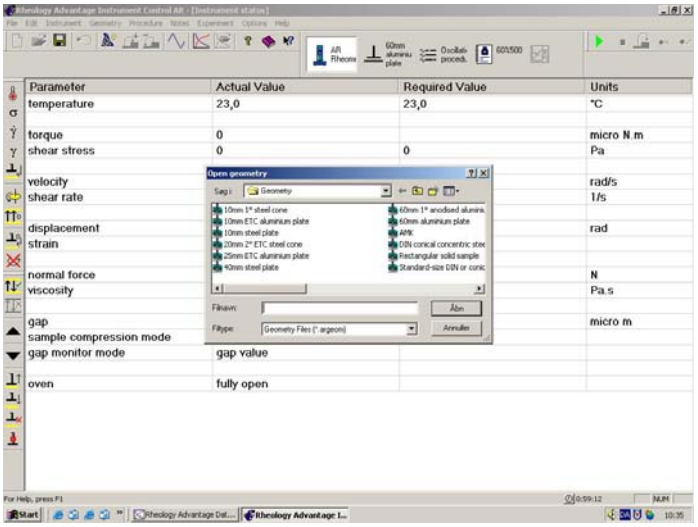
12) On the computer, find the software program AR Instrument Control on the desktop.



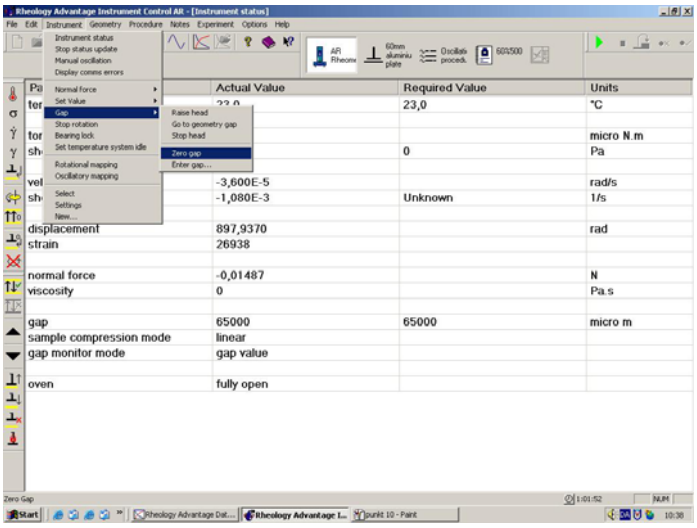
13) Set the temperature.



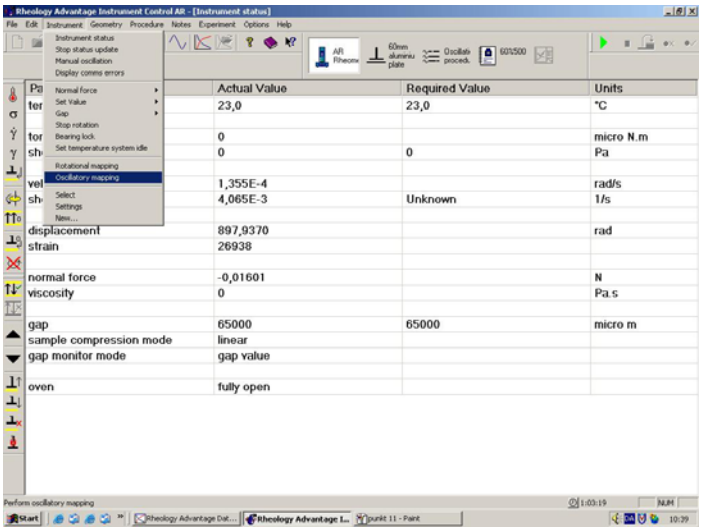
14) To choose geometry go to the tool bar and select geometry/open.



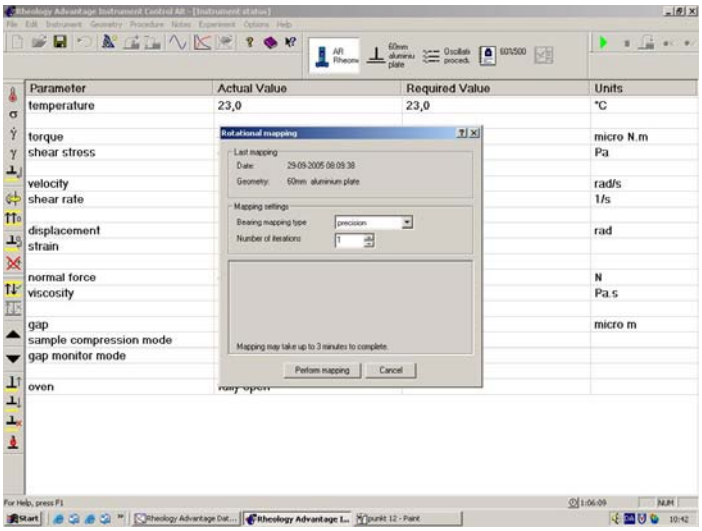
15) Under instrument choose gap and then zero gap to calibrate the distance.



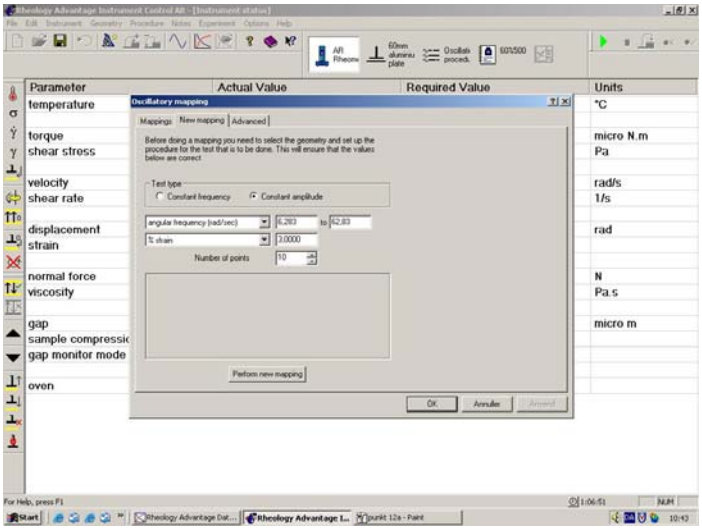
16) Mapping is done by choosing either rotational or oscillatory mapping (depending on what procedure is being runned) under instrument to map inertia.



17) If rotational mapping is chosen: select perform mapping. When a new geometry is selected the program asks if you want to perform a mapping this is the one that is performed.

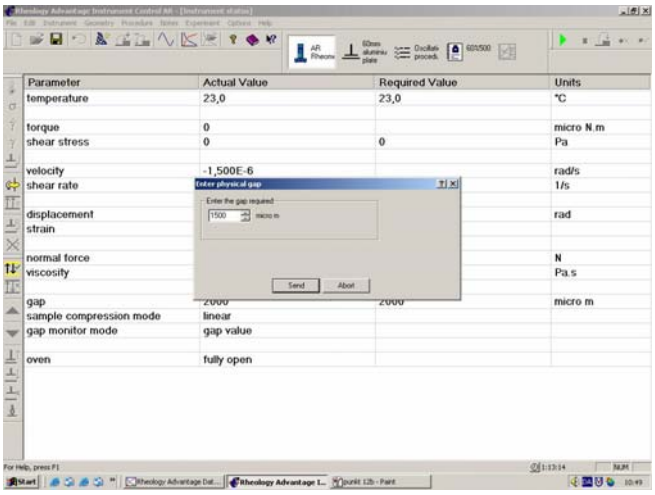


18) If oscillatory mapping is chosen: select new mapping/perform new mapping.



19) Place the sample in the middle of the hotplate and lower the head to 2000 µm.

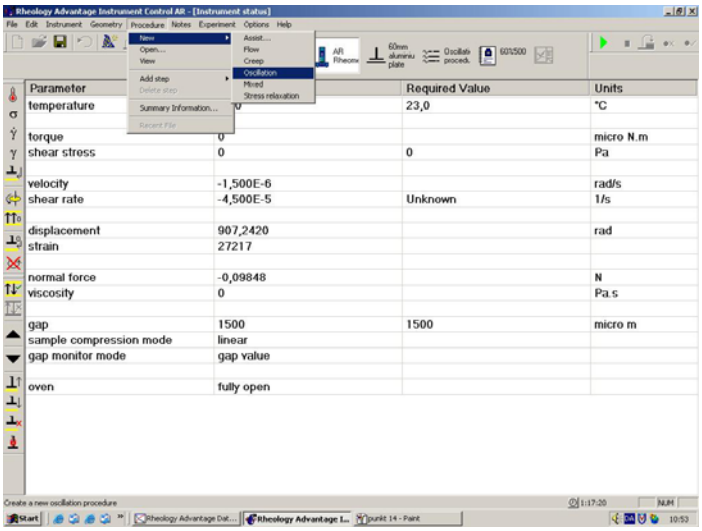
20) Lower the head slowly until the geometric has contact and the surface of the geometry is covered.



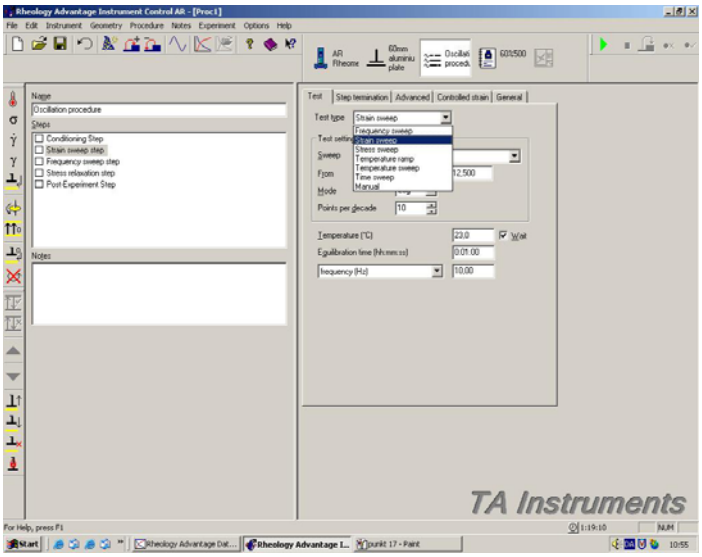
21) Choose type of procedure.

22) If a steady state flow procedure is chosen to measure the viscosity then go to step number 29.

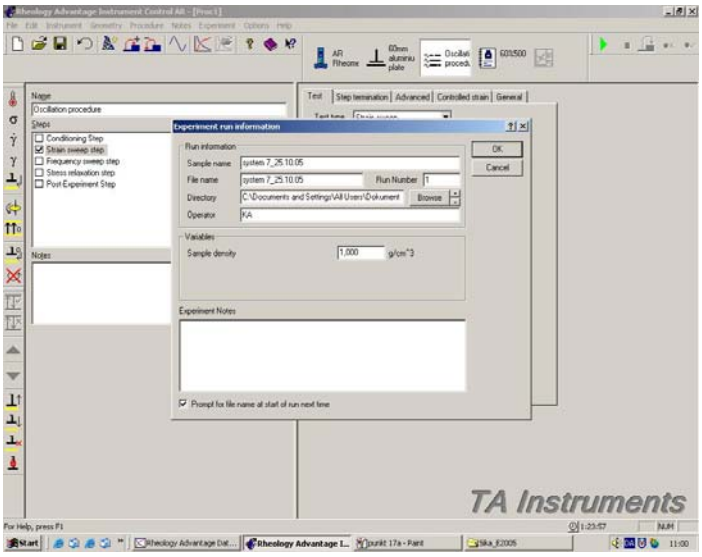
23) If oscillation is selected then choose procedure on the tool bar and choose new/oscillation.



24) Choose strain sweep step and under test type select strain sweep. Under test settings make sure sweep is set to % strain. Strain sweep is done to find the optimal % strain.



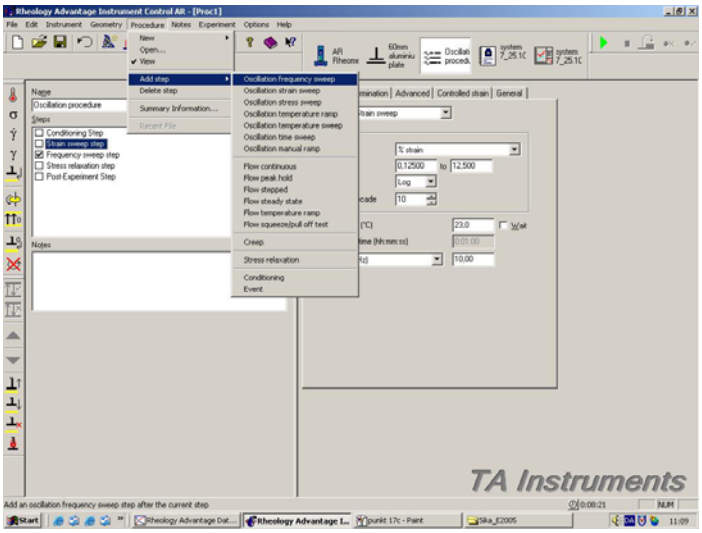
25) Click on the green arrow in the upper right corner (run experiment).



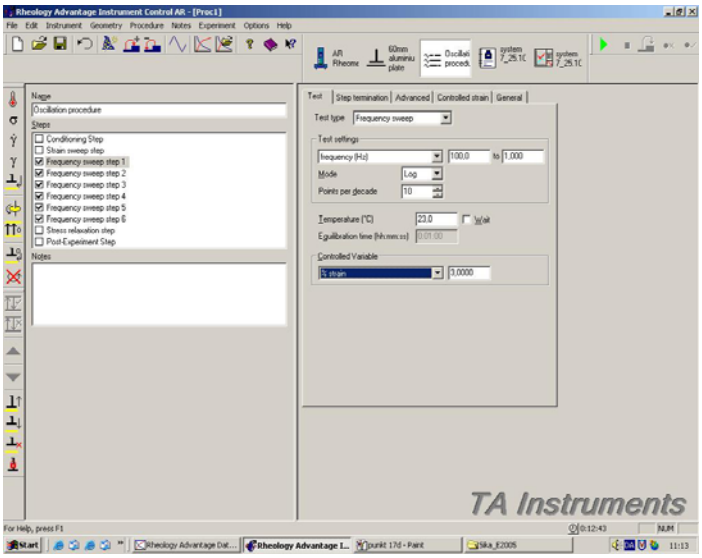
Fill out the boxes as wanted.

26) When strain sweep is done look at the graph for η' and find the linear area. From the linear area % strain is chosen.

27) Under procedure choose add step/oscillation frequency sweep. Add as many steps as wanted



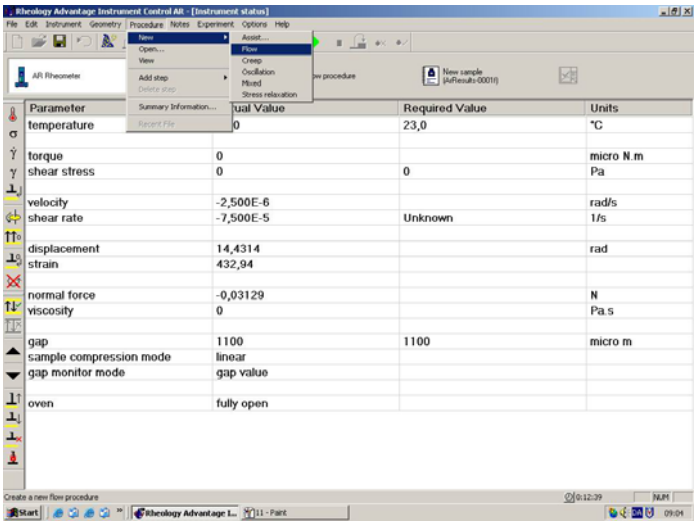
28) and adjust to the right settings.



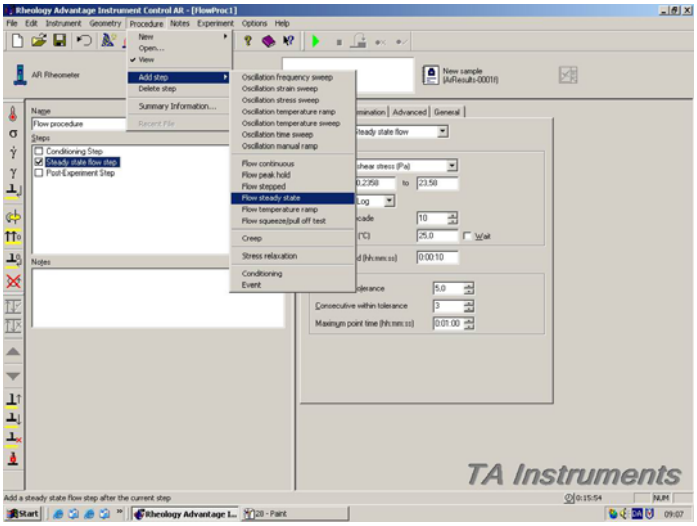
29) Click on the green arrow in the upper right corner and fill out the boxes just like 24

30) Steady state flow is chosen.

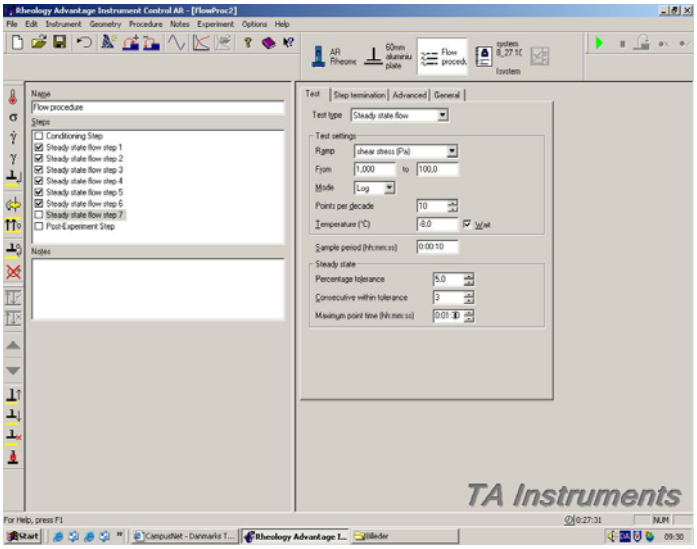
31) Under procedure select New/Flow.



32) Under procedure choose add step/flow steady state. Add as many steps as wanted



33) and adjust to the right settings.

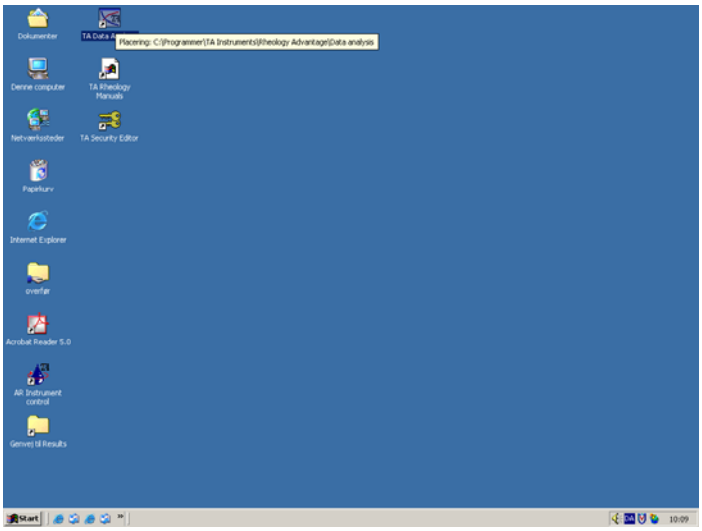


34) Go back and follow 23-24.

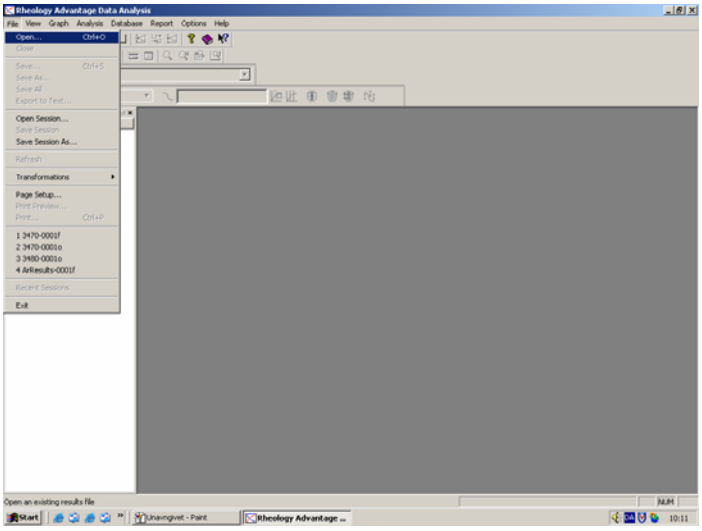
35) When the procedure is done the system needs to be shot down. First set the temp to room temperature. Then remove the sample and to ease the cleaning of the hot plate and the geometric, it is best to take these off: Turn off the cooling water, then press the release button

and remove all three wires. Then click the release button again and remove the hot plate and clean it. The geometric is removed by unscrewing it. Place both things in their rightful boxes so they are easy to find for the next person who wants to use them. Place the covers back on and close the hatches to the rheometer. Turn the control unit to the rheometer off. Then close the pressure valve. Make sure everything is tidy and leave the lab the way you want to find it!

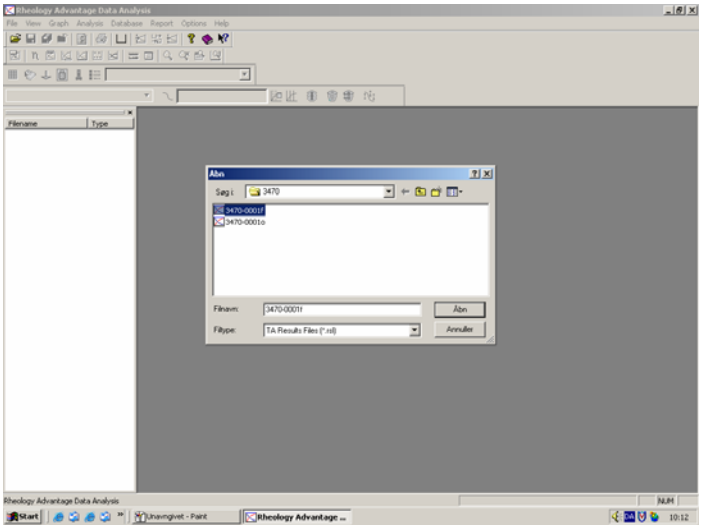
36) To get the data out end convert it to i.e. excel you need to open TA Data Analysis from the desktop.



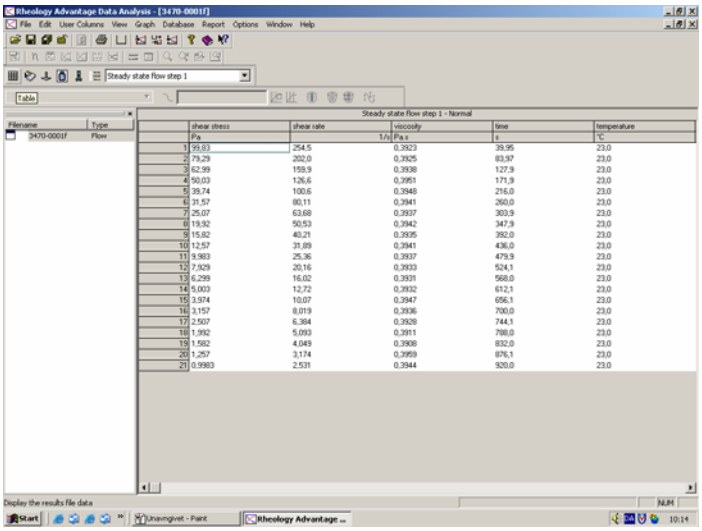
37) Choose file and open:



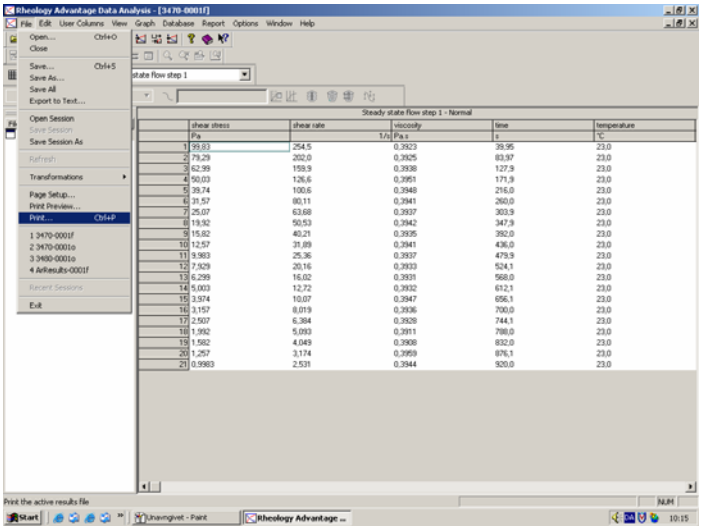
38) Choose sample and press open/åbn in Danish.



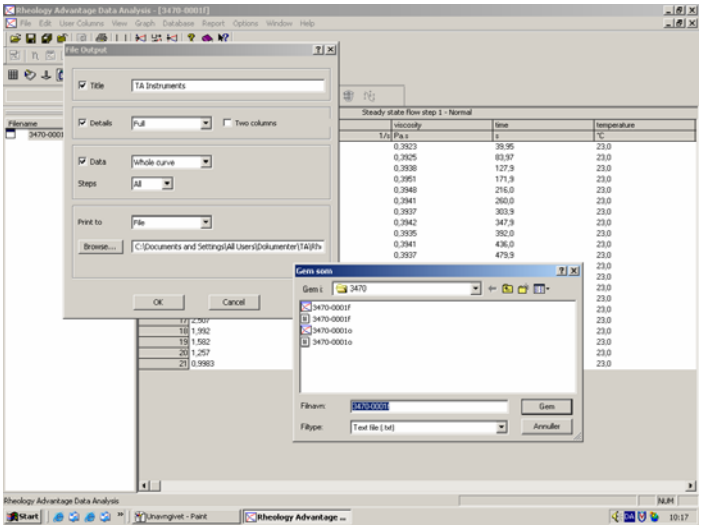
39) Now press the table (white little bow in the upper left corner) and the data will show.



40) Choose file again and then print.



41) In the “print to” box make sure it is on file. Use the browse button to save the converted file.



42) Close the program and upload the converted file to a computer where excel is and then copy/paste into excel.