Carbon Coating

The carbon coating process is carried out by evaporating a carbon thread. It is possible to coat using short pulses of 150 milliseconds or evaporating the thread completely with maximum power, a so-called flash.

Pulse mode:
When using the pulse mode the process can be terminated according to the desired coating thickness (QSG, see 3.6) or a set number of pulses.

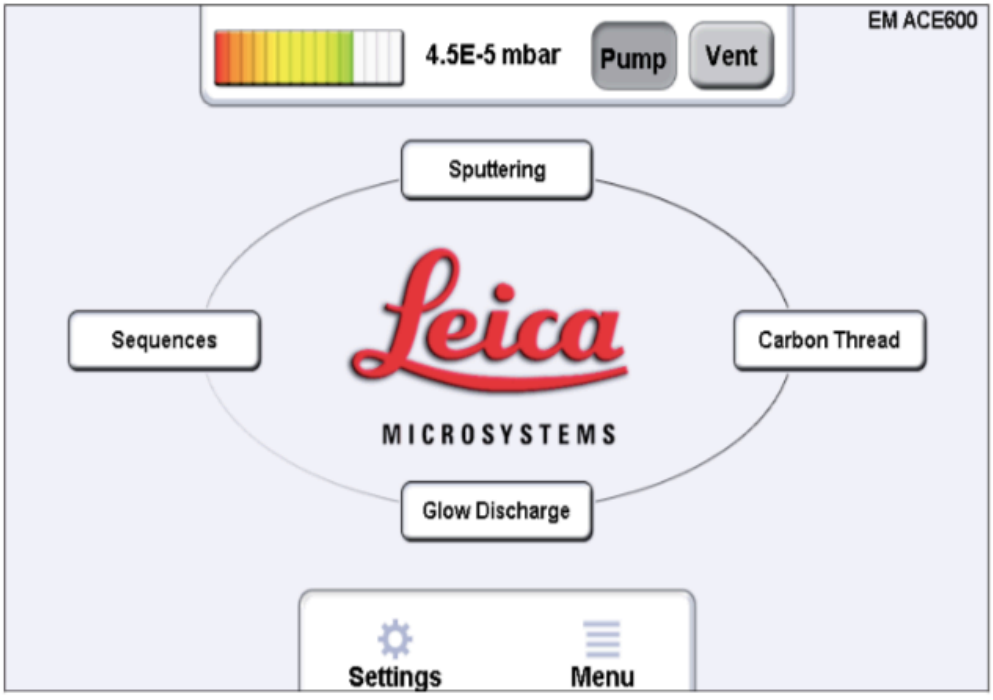
Flash mode:
When using the flash mode the process is terminated after the selected number of carbon thread sections has been evaporated. The resulting thickness is shown in the process summary.

To minimize carbon fibre residues dropping onto the sample we recommend using the "Pulse" mode rather than the "Flash" mode.

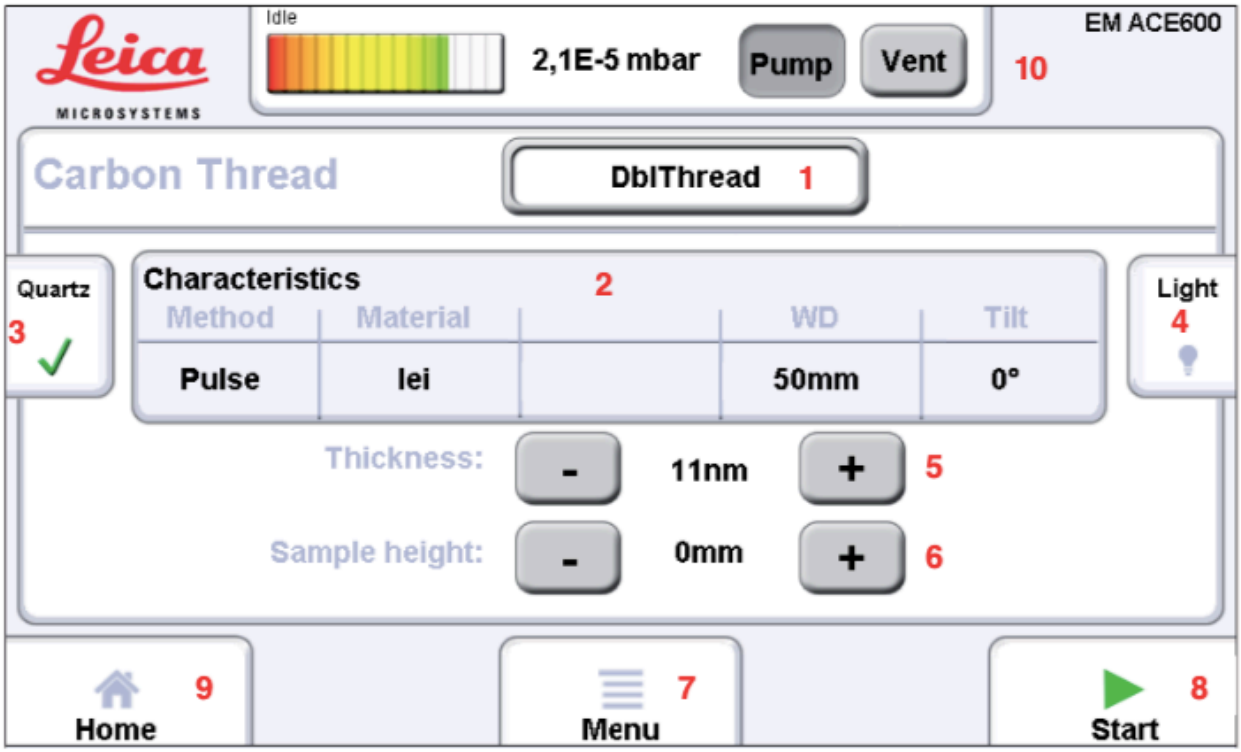
Carbon Coating:

1. Before starting make sure both tanks are open
2. Press vent so you can open the door and load your sample.
3. If you are loading slides make sure they are fully flat and securely in the folder.
    a. Put a small piece of tape on the slides so you can check the coating.

This is the first screen that comes up:
Click on Carbon Thread:



This menu will appear after you click Carbon Thread:



1. Drop down menu for protocols, the most recently used on top
    a. **Select Pulse Double**
2. Characteristic of chosen protocol
    a. Change conditions if necessary.
3. **Enable quartz - green check mark.**
4. Chamber light on/off
5. **Thickness: Set to 2nm for slide of grids**
6. **Sample Height: 1mm for slide of grids**
7. Menu
8. Start the evaporation process
9. Back to start screen
10. Vacuum bar indicating current vacuum, allows to enable pump and vent.

Once you have all your settings correct **hit Start**.

Click **Vent After Process.** 

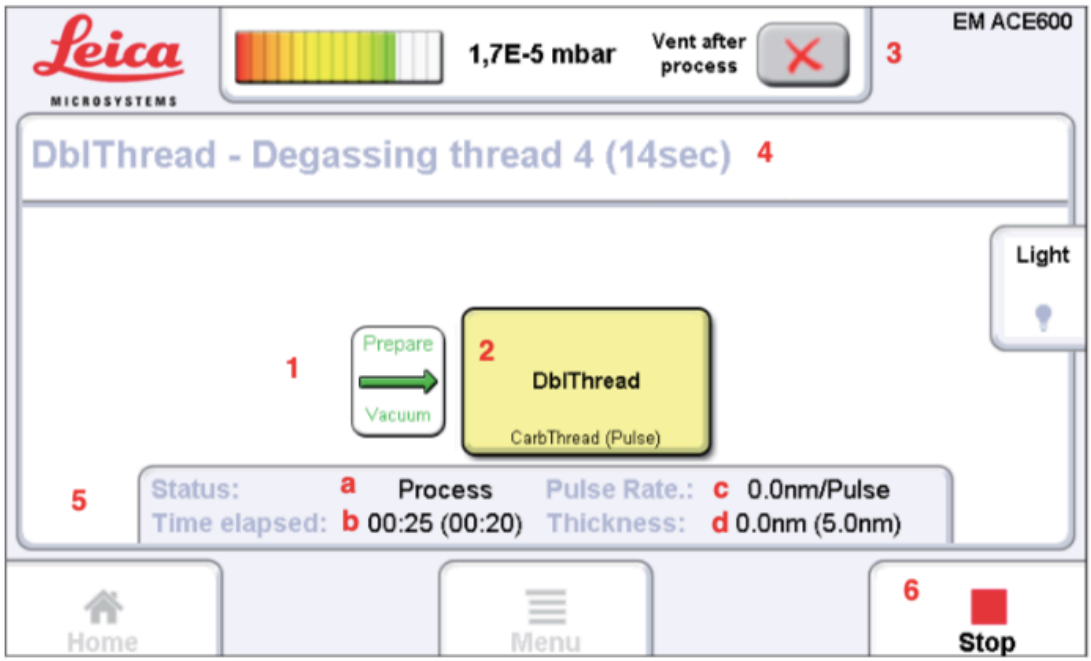
This will turn into a green check mark.

Once your process is complete ($1.0E^{+3}$ mbar) **retrieve your samples.**

Close the tanks.

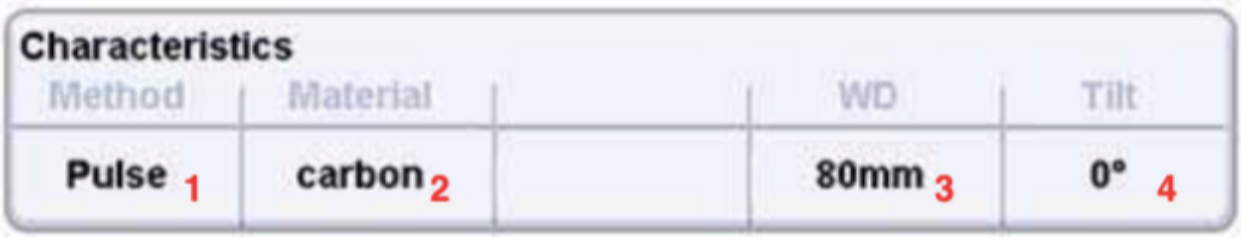
Let the machine pump down for a bit and then turn off the pump.

This screen will appear after you hit Start:



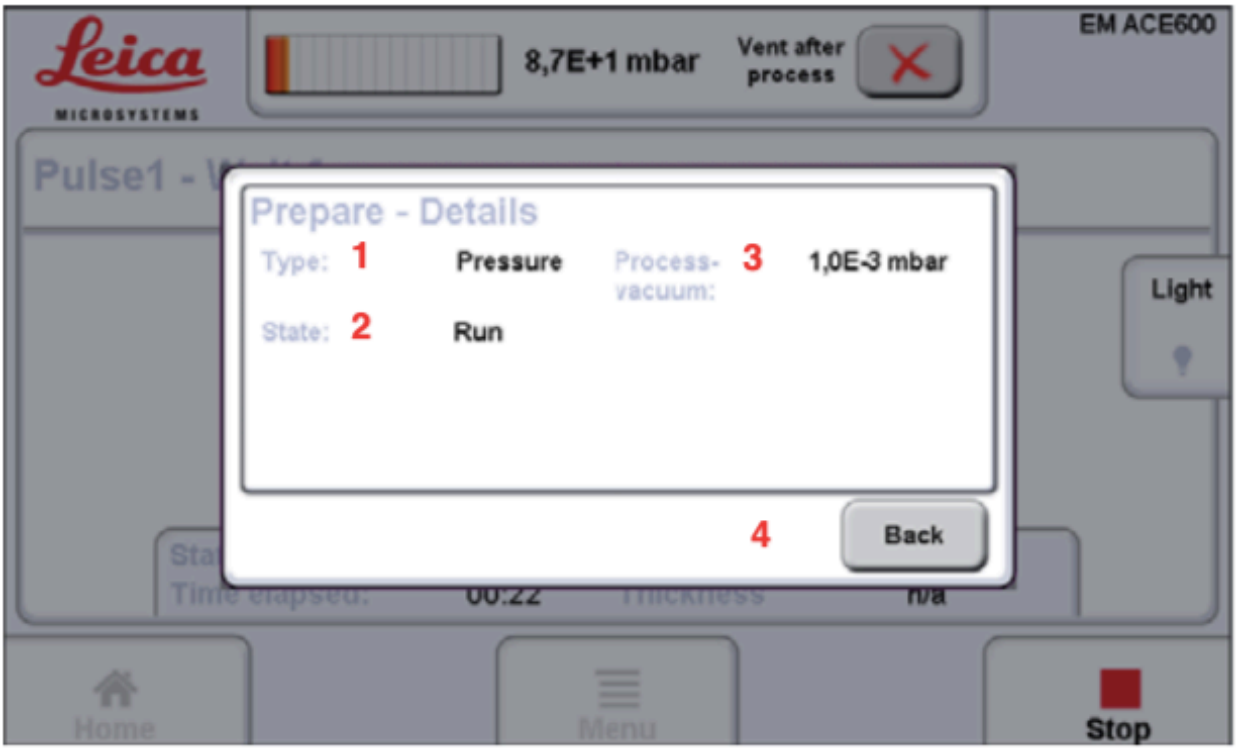
1. Preconditions to be completed, details visible when tapping on it (see below), turns green when done.
2. Protocol which is performed: details visible when tapping on it (see below), turns yellow when in progress.
3. 'Venting after coating' is activated or deactivated. Can be changed at any time.
4. Status bar indicating what the instrument is doing at the moment.
5. Summary of the current process status.
    a. Status (either idle, process or venting).
    b. Time since start button pushed (value in brackets: time since protocol started (2).
    c. Current thickness per pulse.
    d. Accumulated thickness (value in brackets: final thickness to be reached).
6. Stopping the process at any time after confirming to stop.

Characteristics of chosen protocol in detail:



1. Method: Pulse or flash.
2. Material: different kinds of thread possible (e.g. single, double).
3. Working distance: distance of the sample surface to the source.
4. Tilt: angle of the table to the horizontal.

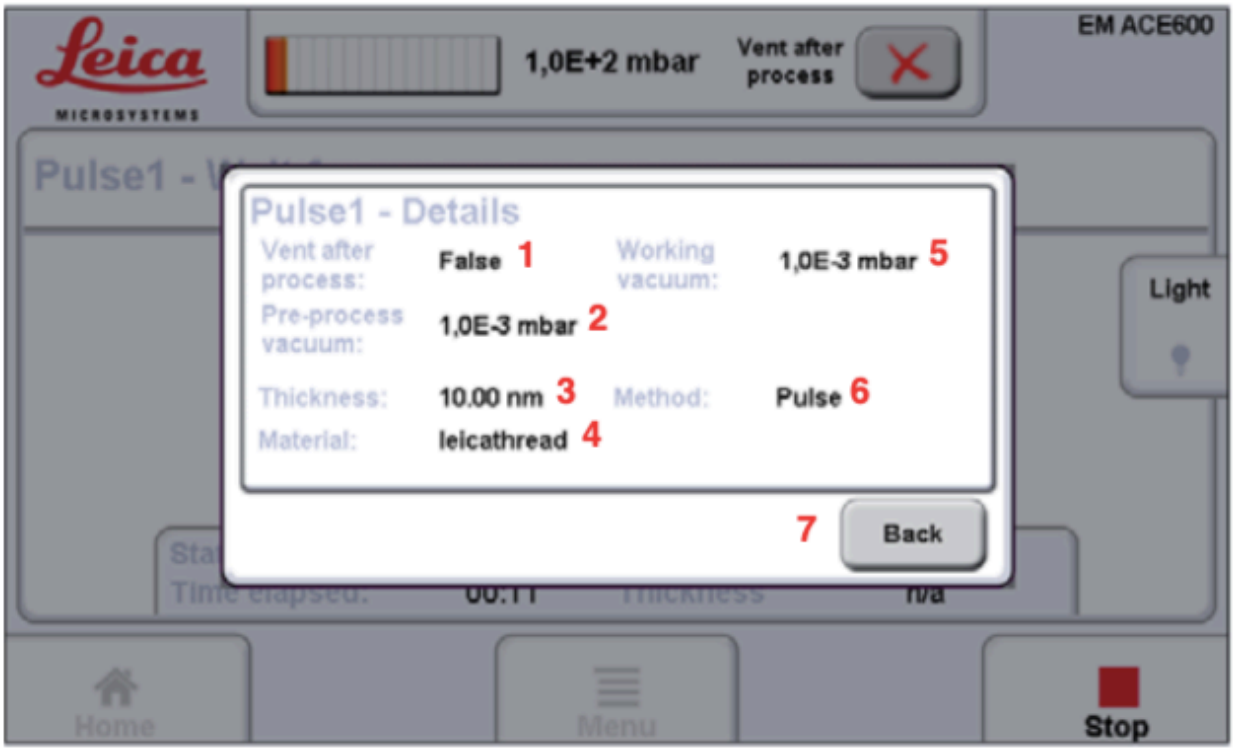
Preconditions details when clicking on the box :



1. Type: condition to reach is pressure.
2. State: process is running.
3. Process vacuum: the process vacuum has to be reached to start the process.
4. Back to running procedure screen.

Protocol details when clicking on the box 

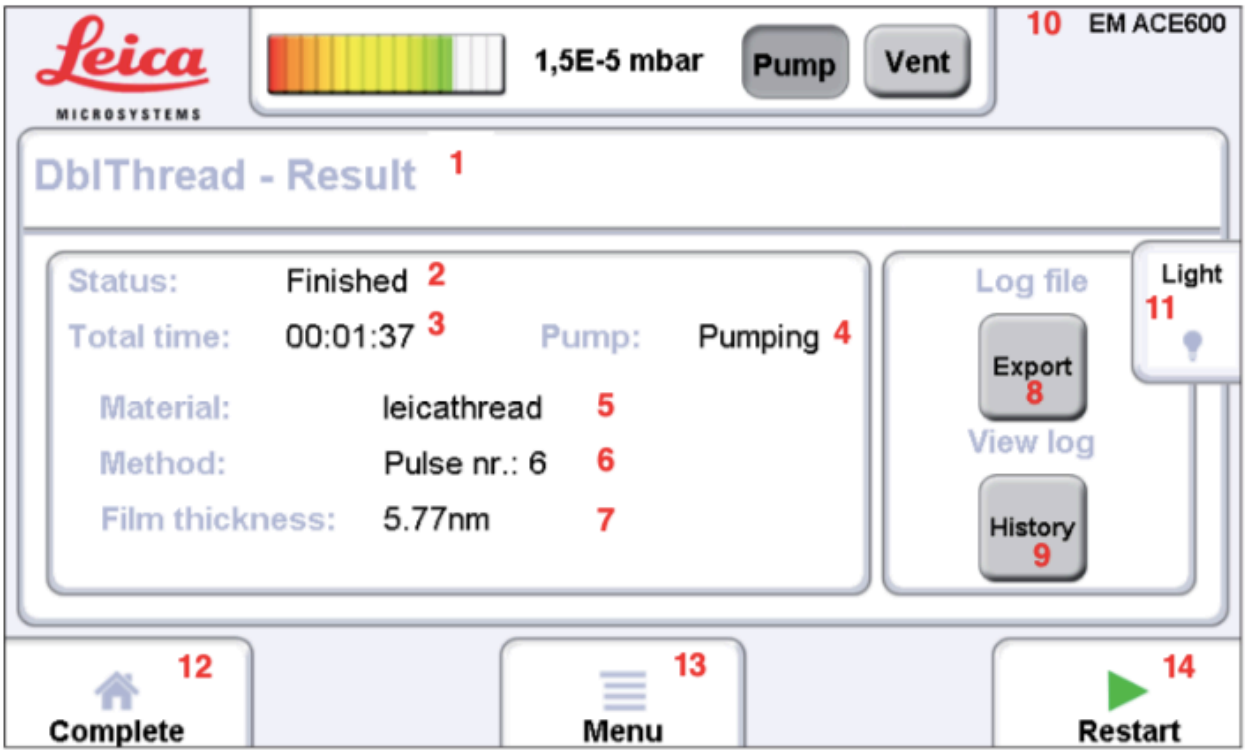
:



1. System vents after process (true) or not (false).
2. Vacuum which needs to be reached before starting the evaporation.
3. Desired thickness.
4. Target material.
5. Vacuum at which the evaporation is performed.
6. Method: Either pulse or flash.
7. Back to running procedure screen.

Each thread is degassed separately before it is used.
The systems waits after outgassing to stabilize the vacuum.

Process is finished, summary screen is displayed:



1. Result of the process run.
2. Status indicates if process was run successfully or failed (finished, terminated or failed).
3. Total time measured after the start button was pushed.
4. Instrument is pumping (vs. venting).
5. Used material
6. Used method and the number of pulses or flashes made.
7. Final layer thickness achieved.
8. Export log files (USB needs to be attached).
9. View the log file to see exactly what happened at each step of time.
10. Vacuum bar indicating current vacuum, allows to enable pump and vent.
11. Chamber light on/off
12. 'Complete' to go back to process screen (before option to initialize the system, stage and shutter).
13. Access the menu.
14. Restart the same process.