

SOP #	WL-25-012
Rev #	0
Date	15-07-25

SOP 012 - Astell autoclave operation

15.07.2025

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Revision #	Date	Author/Editor	Change Description
0	15-07-25	Daniela Dana Danilova	Document Creation

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1. Scope

This SOP describes the procedure for using the Astell autoclave. The SOP also mentions some troubleshooting steps.

2. Summary of Methods

Make sure there is enough water at the bottom of the autoclave, place a temperature probe in water, and keep any bottles or other containers slightly ajar. Close the lid of the autoclave and turn on a programme by pressing 'Start cycle'.

3. Definitions

NA.

4. Health and Safety

When working in the GMO laboratory in Skylab, lab coats, hair nets, and shoe covers are always worn. When working, it should be assumed that everything in the lab is GMO. Therefore, the workbench is disinfected by using 70% Ethanol, both before, and after working in the lab. It is not permitted to take anything out of the lab, and one's hands must be washed thoroughly before exiting the laboratory. Do not spill water on electrical parts of the autoclave.

5. Personnel Qualifications

All DTU Biobuilders team members that have participated in the relevant safety training.

6. Equipment

This should list all the equipment required for the procedure.

- Astell autoclave,

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- Duran bottle (of highest liquid level),
- Autoclave tape.

7. Materials

This should list all the consumables to be used in the procedure.

- MiliQ water,
- Tap water.

8. Procedure

8.1 Setting up the autoclave

8.1.1 Make sure that there is water at the bottom of the autoclave. If you cannot see any water around the level of the metal bottom of the autoclave (just below the basket), then add a 1:1 MilliQ:tap water to the chamber.

8.1.1.1 The display can also notify you to add water to the chamber via "Fill with water" warning (Figure 1).



Figure 1. Astell user interface with "fill with water" warning.

8.1.2 Add a Duran bottle filled with (tap) water up to the highest level of media etc that will be autoclaved. Place the autoclave temperature probe into the bottle. If you are running an instrument cycle, it is best to still place the probe inside water.

8.1.3 Add an autoclave tape onto each one of your items that need to be sterilised. Fold one of the corners so that it is easy to remove the tape later.

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8.1.3.1 The autoclave tape will start off as yellow (or green, depends on the company) and turn black at high temperatures. The autoclave is not a foolproof test for successful sterilisation - it changes colour at high temperatures but sterilisation also has to last 15-20 mins at 121 °C.

8.1.4 Do not tightly screw the lids of the bottles. Tighten them and unscrew about a quarter. This is done to release some pressure out of the bottles. This is done only for bottles.

8.1.5 Load the chamber with your items to be sterilised. Avoid putting heavy items on top of light ones, or placing bottles etc on top of other bottles' lids. Place items in a way that allows for pressure to leave the bottles etc without the lids falling down.

8.1.6 For small items that need to be autoclaved, such as Eppendorf tubes, you can either use the common bin bags and add a tape around the opening (leave a bit of space for pressure to escape), or use a measuring beaker with foil over the top (no need for leaving any air gaps). Make sure to use the autoclave tape.

8.2 Running the autoclave

8.2.1 Once all items have been placed inside the autoclave, close the lid and turn the handle (clockwise to close).

8.2.1.1 If you need to reopen the lid again, press 'Door' at the bottom of the screen (Figure 2), and only then turn the handle anti-clockwise.

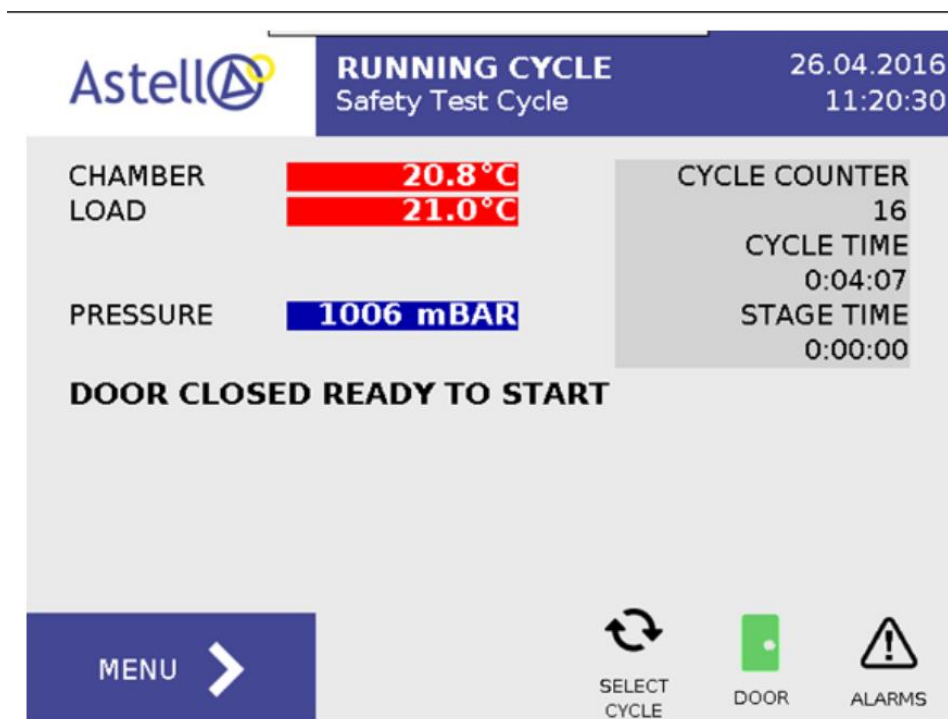


Figure 2. Astell user interface with 'Door' and 'Select cycle' buttons at the bottom right.

- 8.2.2 Press 'Select cycle' at the bottom of the screen. Choose an appropriate cycle e.g. 'Media' for autoclaving media, 'Instruments' for dry cycle (i.e. no liquids to be autoclaved), or 'Fluid discard' for waste. You may need to press the down arrow to see the 'Media' option.
- 8.2.3 Press 'Start cycle'. The autoclave will take about 1.5-2 hrs to finish.
- 8.2.4 Record the use of autoclave in [Autoclave audit log](#) (See Figure 4).

8.3 Finishing the autoclave cycle

- 8.3.1 Once the autoclave cycle is done, the autoclave will make a light beeping noise and the 'Door' button will be visible again. Press on it to unlock the door and turn the handle anti-clockwise to open. Use heat gloves or a towel to close any loosened lids. Take out the items and, if required, dry them in the incubator at 60 °C overnight.

- 8.3.2 If you want to speed up the process and open the door before the chamber has fully loaded, you can jump the stage of the cycle. Do so when the pressure is below 1010 mBar and temperature is below 90 °C.
- 8.3.2.1 Go to 'Menu' and choose 'Stage jump control'.
- 8.3.2.2 Go to the next screen using the right arrow.
- 8.3.2.3 Press on the Astell logo in the top left corner of the screen.
- 8.3.2.4 Press on 'Astell' choice on the screen.
- 8.3.2.5 Enter 666666 (six sixes) and press OK.
- 8.3.2.6 A screen showing the stages (current stage in yellow) will show up. Select 'Complete' and press 'Continue' (Figure 3).



Figure 3. Astell user interface menu for stage jumps.

- 8.3.2.7 The screen will go back to the usual user interface but this time there will be an 'Alarm' button flashing in the bottom right corner. Press on it and repeat steps 8.3.2.2 until 8.3.2.6. The usual user interface should appear again with a green 'Door' button in the bottom right corner. Press it to unlock the autoclave lid and then manually turn the handle anti-clockwise to open the autoclave.
- 8.3.3 Do not close the autoclave lid when done, keep it fully up and open.

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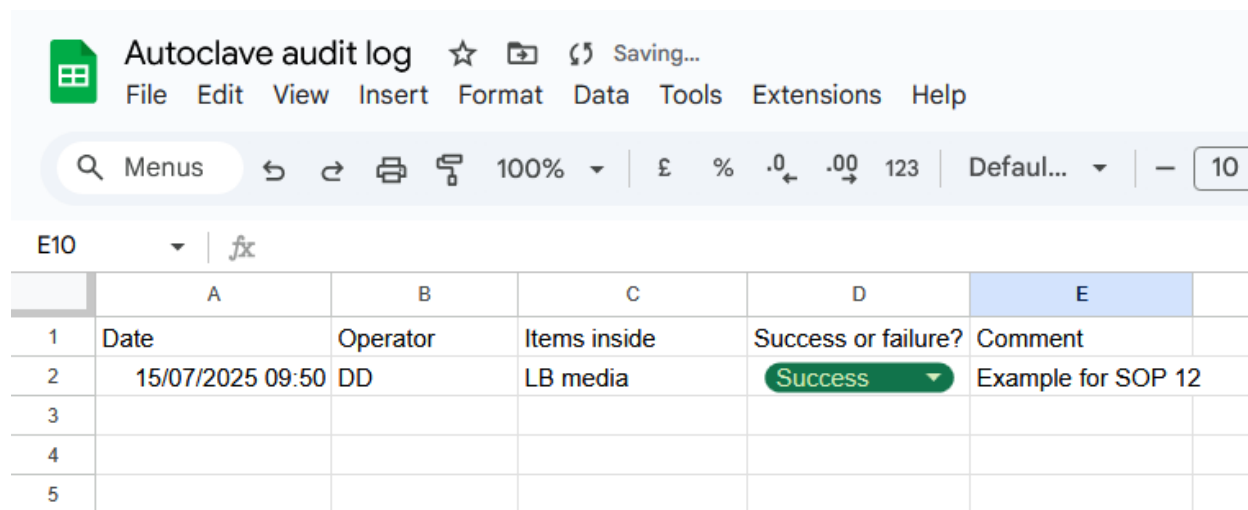
8.3.4 Finish recording the use of autoclave in [Autoclave audit log](#) (See Figure 4).

8.4 Troubleshooting

8.4.1 In case there is a red 'alarm' button in the bottom right corner, record what was the error (e.g. "failed sterilisation step"). Then follow steps in 8.3.2 to unlock the autoclave. You may need to rerun the autoclave cycle with the items to be sterilised if the alarm was showing that the sterilisation time or temperature has not been reached. Note that sometimes the sterilisation time or temperature not reaching the pre-set setting may be a bit wonky and be 1 min or °C off meaning it is alright. Nevertheless, do not use items that you believe have not been sterilised properly.

9. Data and Records Management

Record all autoclaving cycles in [Autoclave audit log](#).



Autoclave audit log ☆ 📁 ↺ Saving...
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	A	B	C	D	E
1	Date	Operator	Items inside	Success or failure?	Comment
2	15/07/2025 09:50	DD	LB media	Success	Example for SOP 12
3					
4					
5					

Figure 4. Google sheet for recording autoclave use.

10. References

Astell manual: [https://www.wolflabs.co.uk/documents/Astell-Scientific autoclaves AMB2 manual.pdf](https://www.wolflabs.co.uk/documents/Astell-Scientific%20autoclaves%20AMB2%20manual.pdf)

11. Appendix

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