**Name of the appendix: Safety instructions for autoclaves**

1. **General**

Autoclaves are used mostly and primarily for disinfecting at high temperatures and under high pressure. As a result, there is a risk of contamination, burns and explosion.

1. **Goal**

The goal of this directive is to define the fundamental safety rules for operating the autoclave and its proper functioning. This directive also applies to new autoclaves that have been refurbished. This directive does not relate to the sterilization process.

1. **Responsibility**

Responsibility for carrying out this directive applies to the user/laboratory director/head of the department.

1. **Reference**

Safety at Work Ordinance (New Version), Chapter 3, paragraphs 10-12.

Safety at Work Regulations (Laboratories).

1. **Permission for operation**
   1. Permission to operate the autoclave will be given to a worker who has been trained by an authorized person in the lab.

Permission will be given in writing by the head of the department/laboratory directors, and with the knowledge of the department’s safety trustee, after the worker/student is tested and found to be competent in operating the autoclave.

* 1. The list of authorized operators will be posted near the autoclave and updated all the time. One copy of the list should be kept in the department, with the safety trustee.
  2. Operation of the autoclave is permitted only to persons who have been authorized and whose names appear on the appropriate lists.

1. **Safety instructions when working with the autoclave**
   1. Safety instructions for working with the autoclave refer to the following stages:
2. Prior operating the autoclave
3. When operating the autoclave
4. Sterilization process
5. End of the process and removing the waste
6. First operation after repair/re-installation
   1. Prior to operating the autoclave
      1. Be sure that you know and remember how to operate the autoclave and that the manufacturer’s instructions are clear to you (read the instructions before operating the autoclave).
      2. Have the appropriate personal protective equipment, including:

* Cotton lab coat with long sleeves
* Closed shoes
* Gloves to protect against heat/chemicals
* Face mask/protective goggles
  + 1. Ensure that the ventilation system in the room where the autoclave is located is operating. It should not be turned off at all when working.
    2. Visually examine the autoclave to check for defects, cracks and damage to the autoclave parts, such as meters, pressure gauges, screws, seals, leaks, etc.
    3. Check that the autoclave has had its yearly inspection by a certified inspector. For your information, the inspection is performed every 14 months, and a device whose inspection date has expired may not be used.
    4. Be sure that the sticker indicating the date of the last inspection and the next inspection are attached to the autoclave (an instrument that has not been inspected should have a label stating “Do Not Use”).
    5. The electrical system should be disconnected when inspecting the autoclave.
    6. The additional energy systems should be disconnected (steam, water).
    7. Check that the contents of the bags placed in the chamber for sterilization do not contain materials, liquids or tools that can explode.
    8. Ensure that the sterilization bags are suited for the sterilization process and are filled up to 2/3 of their volume – and are only closed and not sealed.
    9. Release the plugs before sterilization so as to prevent explosion as a result of the sterilization process.
    10. Do not insert for sterilization glass containers, etc. without the name of the lab and the sender (lab number, first name and surname).
  1. **Operating the autoclave**
     1. The autoclave will be operated in accordance with the manufacturer’s instructions, which should be displayed next to the autoclave.
     2. Be sure that the ventilation system is working in the room where the autoclave is located.
     3. Energy systems should be disconnected when loading the autoclave, until the door has been hermetically sealed.
     4. Open and close the autoclave according to the manufacturer’s instructions.
     5. During any process of loading the autoclave, use protective equipment (as set forth in paragraph 6.2.2).
     6. Do not stop the sterilization process in the middle. Allow the process to come to an end.
     7. A process that was stopped in the middle must be restarted.
     8. For a sterilization process that did not end because of a malfunction, leave the material inside the autoclave and place a sign saying “Do Not Open the Autoclave.”
     9. The operator must be present for the entire sterilization process in order to prevent malfunctions and to stop the process in the event a malfunction is discovered.
     10. Load the autoclave to ensure good circulation of air and steam – do not compact and fill that entire volume of the autoclave.
     11. Bags and glass vessels placed into the autoclave should be placed inside containers that can withstand the temperature and pressure of the autoclave.
  2. **End of the sterilization process**
     1. It is prohibited to open the autoclave door until the internal pressure has reach 0 atmospheres and the temperature is below 80°C.
     2. Disconnect all of the energy sources to the autoclave before attempting to open the door.
     3. When opening the autoclave use full personal protective equipment (see paragraph 6.2.2).
     4. If it is difficult to open, wait until the temperature drops and ask help from another employee (who should also be wearing personal protective equipment as described in paragraph 6.2.2).
     5. The location of the door handle should be on the side of the door and not at the front of the opening.
     6. Be sure that the autoclave and the surrounding area remain clean, dry and without remnants of trash/sterilized equipment.
     7. If there are malfunctions or problems discovered with the autoclave immediately inform the department person responsible, the safety trustee, the section manager, and place a warning sign that says “Do Not Use.”
     8. Regarding autoclaves for which there is a list and monitoring of sterilizations performed, ensure that the sterilization performed is recorded on the form/follow-up log.

1. **Installing the autoclave**

Following installation of a new autoclave or after one has been repaired (in the department or in a workshop outside of the laboratory) the following instructions must be followed:

* 1. Installation of a new autoclave requires authorization from the Engineering and Maintenance Department/Safety Unit.
  2. The minimal requirements for placing and operating the autoclave are as follows:
     1. It must not pose an obstacle or endanger the surrounding.
     2. It should not block pathways and corridors.
     3. Flammable/explosive materials must not be found near the autoclave.
     4. Energy systems for operating the autoclave must not endanger the surrounding area.
     5. The energy systems must be installed by certified entities who are authorized by the University.
     6. The instrument has been inspected by a certified inspector and the inspection report indicates that it is operating properly and there are no comments.
     7. The autoclave is placed in a location with a ventilation and air exchange system.
     8. The autoclave should not be operated until the suitable authorizations are received from the University’s entities (electricity, water, steam, safety).
     9. All safety apparatus and equipment needed to operate the autoclave must be in place and in good working order (meters, valves, seals, etc.).
     10. Safety directives and autoclave operating instructions according to the manufacturer’s requirements must be posted near the autoclave.
     11. A trial run should be carried out with a representative from the manufacturer, in the presents of representatives from the department, the technical department safety trustee, the section manager and the operator.
  3. An autoclave that has been repaired will be operated by a representative of the repair company in the presence of someone responsible from the department, the safety trustee and the autoclave operator.