

# PERFORM Operating Document

## Use and Maintenance of Tuttnauer Table-Top Autoclave

### PC-POD-CA-006-v04

#### Revision History

Version	Reason for Revision	Date
04	Condense version	05/May/2020

## I. Introduction

PERFORM Centre has a Tuttnauer electronic table-top autoclave Model 2540 E. This table-top autoclave is designed for the sterilization of wrapped and unwrapped instruments as well as glassware and liquids. It is a manually operated device, with a control system based upon steam pressure. The operator can select a sterilization temperature from within a range of 212°F - 273°F (100°C - 134°C). Proper decontamination depends on temperature and contact time; steam must contact pathogens long enough for destruction.

**Note: This autoclave is intended to use only for laboratory research experiments. The autoclave is appropriate to sterilize surgical instrument for surgery or biopsy, please make sure to program at 121°C for 40 minutes. Do not use for sterilization of biological waste.**

### *1.1 Training requirements*

Prior to using the autoclave individuals should:

- Read and sign this POD.
- Undergo appropriate autoclave training and/or provide a proof of an external training to the clinical analysis supervisor prior to use.

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**1.2 General precautions**

- To avoid possible damage, do not leave the autoclave un-attended while in operation.
- **Never** place flammables in the autoclaves
- **Never** place materials that become TOXIC or corrosive when subjected to heat.
- Personal Protective Equipment, clothes and other safety measures should be used at all times.
- For proper sterilization do not overload the chamber. Only autoclavable products shall be used; please refer to the materials or instruments manufacturer's instructions for sterilization of unknown materials or instruments. Recommended materials for autoclave are borosilicate glass, polypropylene, polycarbonate plastic and stainless steel.
- Should the autoclave fail to reach the sterilizing temperature/pressure, always check first that the door is fully sealed. If not, then tighten the door bolt further until completely sealed. Allow chamber pressure to reach 0 psi before opening the door.
- USE DI WATER ONLY. The impurities in tap water will create the need for more frequent cleaning and maintenance.
- For cleaning, do not use steel wool, steel brush or bleach as this can damage the chamber and trays.
- To avoid being burned by hot steam, do not place your face over the safety valve.

**1.3 Relevant documents**

- Tuttnauer Operation & Maintenance Manual (Electronic Tabletop Autoclaves Models 1730, 2340, 2540, 3140, 3850, 3870 E, EK, EA & EKA)

**2. Definition of Terms and Abbreviations**

DI	De-ionized
EXH	Exhaust
Personal Protective Equipment (PPE)	Specialized clothing or equipment worn for protection against health and safety hazards. Lab coats, gloves, safety goggles, face shields, long pants, closed toe shoes etc.

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### 3. Procedure

#### 3.1 Autoclave Operation

##### 3.1.1 Preparation before autoclaving

- Instruments to be sterilized must be clean and free from any residual matter, such as debris, blood, pads or any other material. Such substances may cause damage to the instrument or the sterilizer.
- After ultrasonic cleaning or thorough cleaning, rinse under distilled water for 1 minute and pat dry.
- Launder textile wraps prior to reuse, but do not use bleach.
- Be sure that instruments of dissimilar metal (stainless steel, carbon steel, etc.) are separated. Carbon steel instruments should be bagged or placed on autoclavable towels and not directly on stainless steel trays (mixing will result in the oxidation of these metals).
- Load items within the boundaries of the tray (not directly on the bottom) so that they do not touch the chamber walls, or fall off when the tray is inserted into the autoclave. The chamber walls are very hot, items that come into contact with the wall can be damaged.
- Place a sterilization indicator in each tray or inside each wrapped pack. When using a paper / steam resistant plastic bag the plastic side should always be down.
- All instruments must be sterilized in an open position (ex. scissors must be kept open).
- Surfaces that are hidden because the item is in a closed position will not be exposed to the steam and will not be sterilized, loosen the caps of liquid containers. Use suitable wrapping when sterilizing clean equipment for reuse.
- Disassemble or sufficiently loosen multiple-part instruments prior to packaging to permit the sterilizing agent to come into contact with all parts of the instrument.
- Do not overload the sterilizer trays.
- Empty canisters should be placed upside-down, in order to prevent accumulation of water.
- Wrapped instruments should be packed in material which will allow steam penetration and promote drying, such as autoclave bag, autoclave paper, or muslin towels.
- If autoclaving liquids use a heat-proof glass bottle and make sure contents are no more than 2/3 filled with the cap loosely closed to prevent pressure build-up.
- If spotting is detected on the instruments the first step would be to use an ordinary eraser to remove the spot. If removal of the spot reveals pitting then the spot was most likely rust. It may also be an indication that the instruments were rinsed in tap water with a high content of minerals. These minerals when exposed to high temperature and steam will accelerate

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the oxidation of the metal. One suggestion would be to final rinse the instruments in distilled water.

- If the instruments exhibit a discoloration, this can be due to the mixing of carbon steel and stainless steel. When these two metals come into contact with each other electrolysis occurs that breaks down the metal. The best solution is to separately wrap the carbon steel to insulate it from other instruments or the trays.

### 3.1.2 Sterilization Programs

**The autoclave offers three preset sterilization programs at a temperature of up to 134°C and one dry program. Cycle parameters can be customized to suit your needs.**



Unwrapped cycle is use for unwrapped instruments and materials. Correct loading of the autoclave is essential to successful sterilizing. Default settings: sterilization at 134°C, 3 min (no dry).



Wrapped cycle. This cycle is use for wrapped instruments and porous loads. All instruments must be sterilized in an **open** position. Default settings: sterilization at 134°C, 7 min (dry time 60 min).



Glassware cycle. For non-medicinal liquids in open bottles and glassware. Default settings: sterilization at 121°C, 30 min (drying is not allowed).



Drying cycle. Select the accessory drying program to continue the heat assisted drying process.

### 3.1.3 Fill the Water Reservoir

**Note: Daily before operation, check the water level in the reservoir and add DI water when required. Once a week or after 20 cycles (the shorter period) replace the water in the reservoir. Enter the date and time for each use in the log book.**

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- Ensure that the drain valve is in a CLOSED position.
- Remove the water reservoir cover.
- Pour 350-400 mL distilled water or mineral free water into the reservoir through the opening on top of the autoclave, until it reaches the base of the safety valve holder. Under no circumstances fill any higher than the base of the safety valve holder. For the empty reservoir pour 3 liters DI water.
- For proper operation make sure the water level is above the coils of the cooling coil.

### 3.2 Preventive

#### 3.2.1 Daily maintenance

Clean door gasket with a mild detergent, water and a soft cloth or sponge. The gasket should be clean and smooth.

#### 3.2.2 Weekly

1. Clean the air jet. To ensure that the temperature inside the chamber rises properly, it is necessary to keep the air jet clean.
2. After 20 cycles or as required, clean and descale the chamber, copper tubes and the reservoir using Chamber Brite.
3. Put a few drops of oil on the 2 door pins and door tightening bolt screw shaft and bearing.
4. Clean the outer parts of the autoclave with a soft cloth. The water sensor has to be cleaned with a damp cloth once per week to ensure that the water level in the chamber is properly reported to the microprocessor at all times during the cycle. The water sensor is located in the rear of the chamber.

#### 3.2.3 Periodically

1. Once every month clean and check the safety valve (see section 9.6 of user manual).
2. Replace the door gasket every 12 months, or as needed (see section 9.5 of user manual).
3. Once a year inspect the locking device for excessive wear.
4. Drain the reservoir approximately after 20 cycles.
5. Clean strainer (see section 9.8 of user manual)

#### 3.2.4 Draining the reservoir (section 9.3 of user manual)

Caution:

Before draining, ensure that the electric cord is disconnected and there is no pressure in the autoclave. The drain valve is located on the front left side of the autoclave after the door is opened. The function of the drain valve is to drain the water reservoir.

1. Connect the silicone hose, supplied with the autoclave, to drain into a bucket.
2. Turn drain valve counter clockwise to the open position.
3. Fully drain the reservoir
4. With a quart of tap water flush out the reservoir

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5. Turn drain valve clockwise to the close position.
6. Connect the electric cord to power source.
7. Fill the reservoir with 3 liters distilled water to just below the safety valve (see section 6.5 of user manual)
8. Turn on the main power switch.
9. The autoclave is now ready for use.

### **3.2.5 Cleaning the Air Jet**

(Located in the water reservoir)

A dirty air jet is the number one cause of failed cycle

The elimination of air from the sterilization chamber during heat up is critical to the proper operation of the autoclave. If the air jet is clogged, an error message “Low Heat” will appear.

The air jet consists of a small orifice with a clean out wire inserted in it (wire is permanently installed and will not come out). It is required that the air jet be cleaned once per week or more often if necessary, to remove any accumulated dirt and debris. It is preferred to clean the air jet when the unit is running a cycle and under pressure. This is so that any loosened debris will be blown away, however, it can be done while the unit is idle.

1. Remove the water reservoir cover.
2. Clean the hole of the jet by manipulating the air trap wire back and forth 10 times. It is important to clean the hole of the air trap.

### **3.2.6 Replacing the Door Gasket**

Pull off the gasket from the door groove. Install the new gasket as described in the manual page 44. Caution: This gasket is designed with a trapezoidal cross section. The gasket should be placed with the widest side towards the door.

### **3.2.7 Checking the Safety Valve**

(Located in the water reservoir)

In order to prevent the safety valve from becoming blocked, it is necessary to allow the steam pressure to escape through the valve. This procedure should be done every month as follows:

1. Run a sterilization cycle with a sterilization temperature of 273°F (134°C) according to the manual.
2. Allow a pressure of approximately 30 psi (260 kpa) to build up in the chamber.
3. Turn the unit off.
4. Remove the water reservoir cover. This next step will expose you to HOT STEAM so be careful. To avoid being burned by hot steam, do not place your face over the safety valve.
5. Pull the ring of the safety valve using a tool, i.e. screwdriver, hook etc. and open the safety valve for 2 seconds then release. Be careful not to burn your hands.
6. Turn the unit back on and press the STOP key to abort and vent the cycle.
7. Wait until the pressure decreases to zero, only then can the door be opened.