RUTGERS UNIVERSITY Office for Research	RUAC STANDARD OPERATING PROCEDURE	
TITLE: Operation of the Euthanex Smartbox Model TT-8200 Euthanasia Chamber		
SOP Category: Veterinary	**RUAC SOP #: 7.16**	**Page: 1 of 3**
Effective Date: 04/22/2025	**Approval:**	
Revisions: 2/18/2022, 5/19/2022, 04/01/2025		

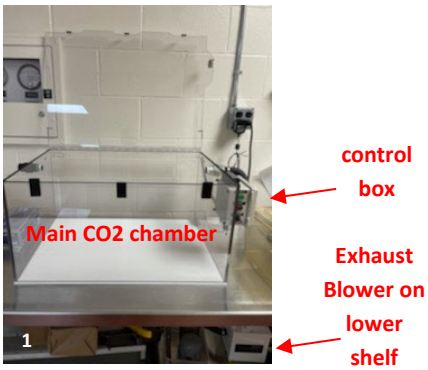
SCOPE: This SOP applies to all Animal Care Staff (ACS), ACS Supervisors (ACSS), Veterinary Staff (VS) and Research Staff members (RS) at the Rutgers Newark, New Brunswick and Piscataway facilities using the Euthanex Smartbox model TT-8200 euthanasia chamber.

OBJECTIVE: The goal of this document is to provide direction on proper use of the Euthanex Smartbox model TT-8200 euthanasia chamber along with reference values for the device.

Note: The Smartbox system (Fig. 1) is efficient system for euthanizing multiple cages of animals in a single cycle. **If you are only euthanizing 1 cage of animals, the single cage euthanasia chamber will be more efficient and should be used.**

Materials:

Main parts of device:



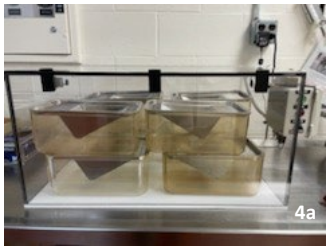
Close up of Smartbox control box in Ready Mode:

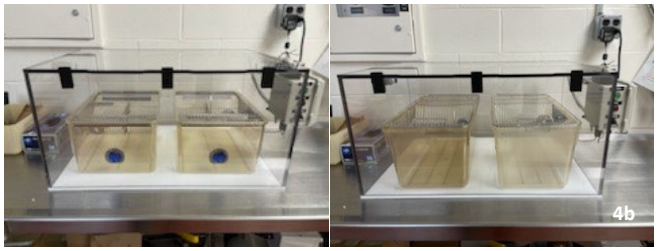
PROCEDURES:

To operate device:

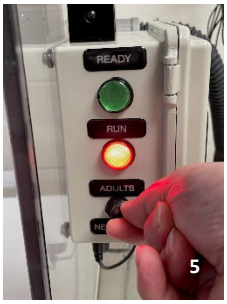
1) Check to ensure the **GREEN READY** light is on (Fig. 2). If not, check to ensure that the power cord is plugged in and that the Smartbox power switch, located at the bottom of the control box (Fig. 3), is set to ON. ***This device should always remain ON***. Next, check to ensure at least 200 PSI remain in the CO2 Cylinder.
2) Carefully release the 3 latches on the front of the chamber and raise the top lid (Caution: to prevent hinge and lid damage, do not allow lid to impact the wall). ***Gas will not flow, and the system will not operate while the top lid is open***.
3) The chamber is now ready to load. Remove filtertop lids from all cages with wire bar lids. For cages without wire bar lids, slightly open and offset the lids. Cages may be stacked in two layers alternating direction or offset pattern to allow circulation of gas to lower-level cages. Do not position upper layer cages directly over top of lower cages. Rat boxes cannot be stacked.

The chamber accommodates up to 8 standard mouse cages (Fig. 4a) or 2 standard or NexGen rat cages (Fig. 4b). Do not exceed the maximum quantity of cages permitted in the chamber. When possible, do not combine cages prior to loading. If a large number of cages must be euthanized, cages may be combined as long as no more than 10 mice are combined per standard mouse box. This will allow a maximum of 80 mice to be euthanized per cycle (8 boxes x 10 mice per box). If combined, mice must be combined immediately prior to starting the cycle.





4) After the chamber is loaded, lower the lid, and **secure the 3 latches.**



5) To start a cycle, raise or lower the black toggle switch located on the front of the control box toward the appropriate age group (adults or neonates). The **RED RUN** light will illuminate, and the euthanasia cycle will begin (Fig. 5). During the **RUN** cycle the top lid lock will automatically engage and will not unlock until the cycle is complete. The cycle cannot be interrupted once started!

6) The system will cycle through three stages:

Life Stage:	Stage 1: Fill	Stage 2: Dwell	Stage 3: Exhaust	Elapsed Time
Adult	8 min. 30 sec.	5 minutes	3 minutes 30 sec.	17 min.
Neonate	8 min. 30 sec.	60 minutes	3 minutes 30 sec.	72 min.

On completion of the Fill and Dwell sequence the system will then go into exhaust mode and require an additional 3.5 minutes until the chamber can be opened. At this point the lock will disengage, the system will reset and return to **READY** mode.

7) After the blower automatically switches off, remove animals and boxes from the chamber. Dispose of the carcasses using the appropriate facility carcass disposal procedure.

An advantage to using this system is that performing **a secondary form of euthanasia is not required when animals are euthanized with the Euthanex Smartbox**. When the cycle is complete animals can be immediately bagged and placed in the carcass freezer. **Usage of the Euthanex Smartbox must be recorded via a dedicated log** containing the date, operator name, life stage selection, number of boxes, and total number of animals for each cycle.

Cleaning:
This chamber is constructed of Plexiglas. A**lcohol or ammonia-based cleaners cannot be used to clean this equipment**. **These chemicals will cause irreparable damage via fogging and/or cracking of the panels.** Chlorine dioxide-based compounds such as MB10 or Clidox can be used but should not be sprayed directly onto the equipment. Spray first into a cloth or paper towel, then wipe down the surfaces. Alternately, hydrogen peroxide wipes or spray can also be used. If neither of these are available, a cloth or paper towel dipped into warm, soapy water should be used (note the cloth/paper towel should be moist but not dripping wet).

REFERENCES

1. https://www.ezsystemsinc.com/ (vendor homepage)
2. AVMA Guidelines for the Euthanasia of Animals, 2020 edition

Appendix:

Note that the following parameters have been pre-set by CMR veterinarians and should not require adjustment. Values are listed for reference only and for trouble-shooting purposes.

CO2 Source: CO2 cylinder valve should be set to the fully OPEN position by turning the knob to the left until it stops.

Heated Regulator/Flow meter: The front gauge (regulator outflow pressure) is to be set to at least 75 CFM (35 LPM); the posterior gauge reflects the pressure of the CO_2 cylinder (regulator inflow pressure) and cannot be adjusted. Cylinder pressure must be monitored, with low or empty cylinders being replaced as needed. (Fig. 6). To prevent freezing during use, this heated regulator unit must remain plugged in to a 110V outlet at all times.

A lockout device such as a Prinzing donut may be placed over the flow meter control knob to prevent adjustment.

Inside chamber dimensions: 27.5” x 19” x 13.75”

Chamber volume: 7184 in^3. = 117 liters

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Supplemental Page: Example of Use Log

Euthanex Smartbox log

Date	Operator	PI / Protocol	Adults/ Neonates	# of boxes	# of animals	Initial