Ferret Caging Specification

Introduction

The National Institute of Biological Standards and Control (NIBSC) is a world leader in assuring the quality of biological medicines through product testing, developing standards and reference materials and carrying out applied research. To be able to meet the revised EU directive requirements for floor space of an adult ferret (6000cm2), the Biological Services Division (BSD) within NIBSC are looking to replace their current mobile caging, which does not meet requirements. The caging will be designed as 'towers', consisting of 2 cages per tower, with each cage able to house a single adult ferret. BSD require 8 towers, equalling 16 cages in total.

The caging is to be used in containment areas such as CL3 & CL4 and will therefore need to be versatile, to ensure it is suitable for use in various areas of work.

Mandatory Requirements

- Must be made of a durable metal, but as lightweight as possible, to enable one user to be able to transfer. Weight cannot exceed 60kg. Discussions will need to take place regarding the use of stainless steel or aluminium for the external frame.
- All metal used must be stainless and non-corrosive.
- The complete tower, including wheels, cannot exceed 1600mm in height.
- The width of the external frame must not exceed – 995mm. depth of frame – 775mm
- The cage door must be a minimum of 400mm in width and will sit no lower than 150mm from the base *(See fig 4)*.
- A light deflection plate must be included on the lid and be approx. 600mm x 380mm in size.
- The internal cage measurement must be at least 900mm length x 680mm depth.
- It is advisable for suppliers/manufacturers to attend a site visit and calculate their own measurements for accuracy.
- The surface area of internal floor space must be a minimum of 6000cm2 although bigger would be preferred if possible.
- The tower must hold two cages on one external frame.
- All panels, external frame and cage furniture must be able to withstand fumigation with formaldehyde or similar.
- All panels, external frame and cage furniture must be autoclavable up to 134◦c.
- There must be no sharp edges on either the external frame or the cages.
- All corners are to be curved to reduce risk of injury to staff and animals.
- Wheels must be made of a material which can withstand autoclaving and fumigation - with brakes on both front wheels.
- Wheels must be able to withstand motion on a rough tarmac road surface and be able to keep vibrations to a minimum.
- Cages must not have gaps, especially within the internal space, which could trap an animal's paw or biological materials *(see fig. 12)*.
- Cages must not squeak, knock or shudder with movement at transfer or animal movement, to reduce stress to the animal.
- The supplier must be willing to work closely with the BSD team to ensure the design and manufacture is suitable and specific for the requirements. Drawings are to be made up and discussed in detail with the relevant BSD staff before any manufacture takes place.

- If possible, BSD staff would want to visit the manufacturer to witness the cage(s) being made.
- It would be preferable for a prototype to be developed and manufactured for review in the first instance, prior to a bulk order being processed. The agreement would be that the prototype, if successful, would then be used as the template for the bulk order. The prototype may be subject to minor changes.

Design

- The design must consist of two collapsible cages sitting on an external frame. It is not mandatory for the external frame to be collapsible. *(see fig. 1)*
- Each side must be a separate panel. This will make the assembling and dismantling of each cage simple and lightweight for improved ergonomics.
- Metal posts must slide into each panel to connect the cage sides together, the top of each post is to be smooth and triangular, to create further rigidity. *(See fig. 2)*
- Once panels are connected, the 4 sides will sit within a base. (see fig. 3)
- A thin plate is to be used as a "Lid" to stop animals escaping. The design of this will require further discussion with the manufacturer. Suggestions for a more practical design than that of our current cage system would be welcome.
- If any Perspex is used in the design, it must be able to withstand fumigation and be autoclavable to 134c.
- The gravity door latch shape must be simple in design and contain no springs. *(see Fig 5 & 6)*
- To enable staff to push/pull the entire tower, the fixed frame must be tall enough to allow ergonomic movement. This will also prevent the cage(s) slipping off. *(see fig. 7)*
- The front panel must be smooth and will need to incorporate holes so that food bowls can be attached, and water bottles can be placed. Alternatively, the water bottle can sit through the wire mesh. *(See fig. 8 & 9.)*
- Wire mesh will be used on each side panel, the circumference of which will be approx. 25mm x 47mm *(see fig. 10 & 11 for comparison)*.
- The base in which the panels sit into must be made of a rigid but lightweight metal. Base does not need to be higher than 20mm. *(see fig 13)*
- Each panel will consist of a solid metal surface of 150mm from base, and the remainder of the panel will consist of mesh *(see fig. 14 & 15)*.
- Please explain how you can provide added value to this contract.

Additional Features to Consider

- A detachable nesting box/shelf which must be autoclavable and able to withstand fumigation, preferably made of Perspex to keep cage weight down.
- Supplier to provide 2 sets of the following items for each cage: water bottles, water bottle holder and food bowl holder. These must all be autoclavable and able to withstand fumigation.
- For the CAT4 building, a ramp may be required. The ramp can be a simple design of two long plates which the wheels of the tower roll on to, creating two channels. The two plates can then easily be moved between exits and chambers. Plates would likely require checkerboard tracking for grip.

Fig. 1 - Example of "tower" design. Consists of 2 cages sat on an external frame.

Fig. 2 - A poll will firstly go through a lid and then through each side panel, to connect the panels together and secure the lid into place.

Fig. 3 - An example of the way in which the 4 side panels will sit into a metal base. They will not be fixed/attached to this base.

Fig 4. – Front panel will have a wide, hinged door sitting approx 150mm high on the panel.

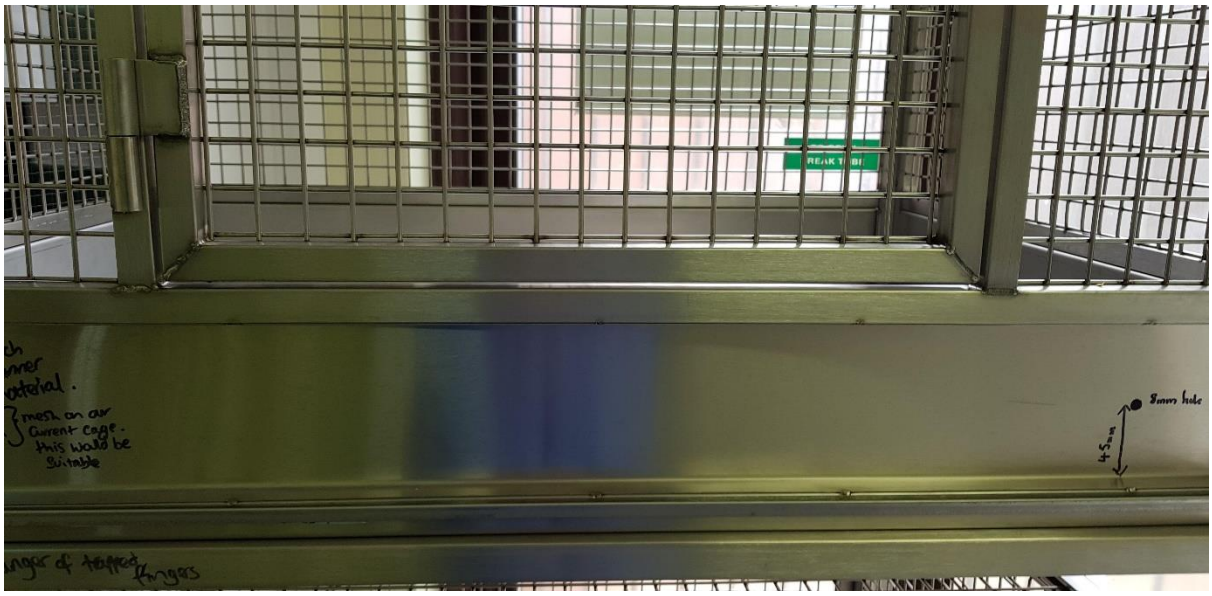

Fig. 5 - An example of an unsuitable latch.

Fig. 6 – An example of the type of door latch which would be suitable.

Fig 7. Shows the general height of the external frame. This frame runs across the sides and back to prevent the cages from slipping off. The frame will allow the user to push/pull without the risk of being bitten by the animal inside the cage.

Fig 8. Example of the hole on the solid part of the front panel, allowing a coop cup to be attached to the cage.

Fig. 9 – The water bottle can be attached to the wire mesh. New water bottle holders would be beneficial. Must be able to hold a 250ml autoclavable bottle. Different sizes could be considered to fit a 500ml bottle also.

Fig. 10 – Example of the style of wire mesh which is desired for the cages.

Fig. 11 – Example of the type of wire mesh that is unsuitable for this cage, due to the thickness adding to the overall weight of the cage. It is also not aesthetically pleasing.

Fig. 12 – The gap between the frame and cage base is too large. Poses a risk of fingers getting trapped. There must be minimal space between.

Fig. 13 – The base on the left-hand cage is suitable to hold the panels in place. The base on the right cage however is too deep.

Fig. 14 & 15 – All sides of the cage will require a solid metal plate which is then attached to mesh. Mesh can be fused straight onto the metal plate, rather than the cage having further framing.

Fig. 15 – Another aspect of the metal plates. All internal areas must be smooth, like the left-hand panel in this photo.