

# Building Conservation-Grade Support Systems for the Long-Term Storage of Fossil Vertebrates



## 1. Introduction:

This poster presents the fabrication of support systems for long-term storage of vertebrate palaeontological specimens. The Conservation Unit in the Palaeontology Department at the Natural History Museum, London, UK, is regularly presented with opportunities to develop mounts for heavy, complex-shaped and often fragile specimens.

The mounts must:

- Be strong but light-weight
- Provide maximum access with minimal handling.
- Fully support the specimen without applying pressure to weak points

Various support solutions may be achieved using the laminating epoxy paste Epopast 400 as a primary material. User-friendly, space-efficient and functional design features can be achieved with this versatile support medium, which is especially suited to fossil vertebrates.

## 2. Epopast 400:

Epopast 400 (bisphenol-A & F-epichloridin epoxy & polyoxyalkyleneamine) is an epoxy/fibre glass laminating paste launched by Axson in 2004 as a low odour, low density component for the production of negatives, fillets and reinforcements. The paste produces excellent moulds and offers a stable, robust, lightweight, non-vapour releasing jacketing material (hardness shore 81/79, flexural strength 48 when mixed).



R3804 - *Suchodus brachyrhynchus*: A twin-layered support allows reduction in storage footprint (specimen length: 815 mm).

## 3. Step-By Step Construction of Basic Epopast Support

1. Protect the specimen with cling film.
2. Fill under-cuts with modelling clay
3. Mix Epopast 400 resin with hardener at 100:14 ratio by weight.
4. Cover the Epopast with cling film or melinex to create a smoother finish.
5. Fresh Epopast may be added to cured Epopast if more strength is needed.
6. Grind the rough surfaces of the cured Epopast with rotary sanders under good ventilation.



IC291 - *Glypheoid Lobster*: a tray mount to allow examination of a highly fragmented specimen as a whole while supporting the weak joints (specimen length: 320 mm).

## 4. Things to consider before starting:

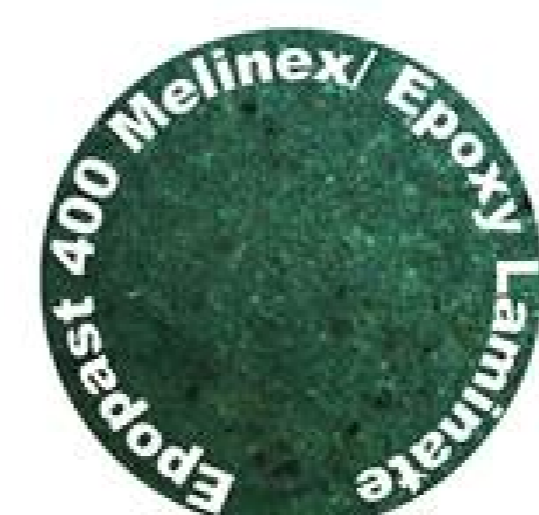
Before starting the specimen has to be able to withstand light pressured from the application of the paste.

**In the Cases of Single Sided Support** Often specimens need to be supported on their the least complex surface. In this case a temporary jacket can be made with polyester and fiberglass for inverting the specimen. Alternatively, depending on the condition of the specimen, it can be supported on a tyvek pillow, filled with ethafoam chips.

**Internal Padded Lining of the Support** The Epopast mounts are lined internally with Plastazote, and where necessary Tyvek, to avoid abrasion against the hard fibrous surface of raw set Epopast. From experience we have found the thinnest possible (1-2mm sheet) plastazote works best. This prevents uneven compression by heavy specimens. Additionally, when creating an Epopast mount for more complicated specimens (with curves and undercuts) a rolled, thin sheet of modelling clay should be applied to the specimen before applying the Epopast. When the Epopast is set the clay can be removed and in its place the plastazote can be adhered. The mount will match the contours of the specimen.

**Base Board** When the specimen is too large or heavy for a bespoke box, the base board should be long enough to protect the specimen from accidentally knocking other specimens while moving them within the storage cabinets.

**Final Finish** Epopast 400 sets into a rough fibrous finish that needs both preparation and final modifications. Covering it with films such as Melinex and cling film will reduce the fibrous appearance, yet it is often necessary to modify it further. This can involve grinding, painting or lamination with epoxy resin.



## 5. Health and Safety

**Mixing and applying Epopast 400:** The hardener is corrosive and harmful in contact with skin and eyes, or if swallowed. The resin contains fibres which are irritating and is toxic to aquatic organisms. Mixing the paste and hardener together must be carried out under fume extraction. Where extraction is not available, the area must be well ventilated and charcoal filter facemasks must be worn. Eye protection must be worn at all times. Protective full-length heavy duty latex chemical gloves are to be worn when mixing and applying the paste.

**Grinding cured Epopast 400:** All cutting, grinding and rubbing down must be carried out in a dust extraction booth. Eye protection must be worn at all times. Wear thick rubber or leather gloves to protect against glass fibers.



M8379 - *Arsinoitherium zitelli*: Plinth support allows the specimen to be fully accessible and visible while providing strong support and minimizing handling (specimen length: 560 mm).

## 6. Suppliers:

- **Epopast 400:** laminating epoxy fibrous paste by Axson.
- **Hexlite:** aluminium centred honeycomb board, 620 aluminium faced, from Conservation by Design.
- **Aluminium Foil Tape:** adhesive tape from Conservation by Design
- **Low Melt Adhesive:** Tecbond LM44-12-200 from Preservation Equipment Ltd
- **Plastazote LD40 2mm:** inert polyethylene foam from Zotefoams
- **Tyvek:** non-woven, high-spun bonded polyethylene fabric from Preservation Equipment Ltd
- **Melinex:** polyester film from Conservation by Design.
- **Ethafoam:** polyethylene foam by Dow Corning.

*All materials listed above have passed Oddy tests for permanent use.*



OR 32599 - *Pelagosaurus typus*: a double-sided mount to allow the specimen to be turned over whilst support is maintained (specimen length: 190 mm).

7. Traces of cling film (if used) may be removed using a wire bristle brush.
8. The smoothed Epopast can be painted using acrylic colours.
9. Low-melt adhesive may be used to attach Plastazote to create a cushioning layer and Tyvek, if necessary, to prevent abrasion.
10. Hexlite can be cut to form a base board
11. The edges of the Hexlite can be covered with aluminium foil tape.
12. The mount may be attached to the base board by punching holes at contact points and applying fresh Epopast into both the holes and onto the underside of the mount.

