

NML Approved Materials List

This document to be read in conjunction with the Design Schedule and prior consultation with the Design and Conservation Departments.

1 *Materials: Display Case Interiors - General Considerations*

- 1.1 All materials to be durable and maintainable.
- 1.2 All materials to be used within display cases to be inert and stable, proven for safe contact with objects without releasing corrosive or tarnishing vapour. All materials for case interiors to be selected from NML's approved list where possible. For any other materials not on the list, product data, samples (if required) and documented proof of material being passed 'Permanent' by Oddy Testing to be supplied to NML for evaluation. Oddy Tests take a minimum of 4 weeks for a result. As some materials can fail material testing, alternatives require selecting and further testing may be required, the programme must take this time requirement into account.
- 1.3 Safety data sheets for all materials used should be approved by NML prior to manufacture. Safe use of materials on-site should be agreed with NML's Health & Safety Dept.
- 1.4 Minimum periods required for curing/off-gassing before installation of any materials into case:
 - adhesives 4 weeks
 - glazing, water based paints + varnishes 2 weeks
 - sealants 1 week

2 Dress panels

2.1 Dress panel construction

NML approves four materials for interior construction. These panels should have sufficient load-bearing capacity for display of objects, staging and during installation (see Design & Display Case Schedules). Some additional support structure may be required under rigid PVC boards.

- 2.1.1 **Forrex™** PVC rigid board is preferred for use for dress panel construction, minimum thickness of 19mm for load bearing and structural requirements and in agreement with NML. This has the closest physical qualities to MDF but without any harmful off-gassing of pollutants, less dust from cutting and less impacts on health.
- 2.1.2 **Foamalux™** is another alternative PVC rigid board being very similar to Forrex™ but with a slightly softer exterior surface layer. A minimum thickness of 19mm should be used for dress panels. This has similar physical qualities to MDF but without any harmful off-gassing of pollutants, less dust from cutting and less impacts on health.
- 2.1.3 **Metal panels** with powder-coated finish. Powder-coating system and process to achieve fully inert, fully cured finish. Adequate support structures should be provided beneath.

- 2.1.4 **Formaldehyde-free Medium Density Fibreboard (e.g. ZF MDF):** Where internal structures require greater load bearing strength, and in agreement with NML, may be approved if covered with a heat-sealed barrier film such as Moistop, wrapped with NML approved fabric or coated with four coats of Dacrylate™ (or agreed alternative) water based (non-V.O.C. emitting) acrylic lacquer. Fabric should be fixed using approved tapes, and the barrier film over ZF MDF should not be punctured i.e. fabric should not be stapled. For tapes and adhesive film currently approved, see below.
- 2.1.5 Alternate panel materials: Dibond, Lucabond or Hexlite may be used in certain circumstances, with prior approval from NML.

3 Dress panel textile coverings

- 3.1 Dress panel fabric should be fixed using approved tapes and/or staples may be used. Only tapes and adhesive film currently approved may be used (see Approved Tapes below). Where paints are used, as agreed with NML (see Display Case Schedule) these should be approved water based emulsion paints applied to a pre-“keyed” surface. Only primers approved by NML be used, where these are appropriate, for use on Forrex™ or Foamalux™ PVC rigid board and approved ‘Permanent’ by Oddy Testing and in agreement with NML

3.2 Internal plinth/staging construction

- 3.2.1 Forrex™ PVC rigid board. NML approves and considers the use of this board as the default choice for use for construction of staging and plinths. Minimum thickness of 19mm should be used for load bearing and structural requirements.
- 3.2.2 Foamalux™ rigid PVC board may be used as an alternative to Forrex™, in agreement with NML. This inert board is similar to Forrex™ but with a slightly softer exterior surface layer. Minimum thickness of 19mm should be used for load bearing and structural requirements.
- 3.2.3 Baumann Unisono III textile, or other as approved and agreed. The colour of this dress fabric as per Design Schedule and as agreed with NML. This should be fixed using approved tapes and/or staples may be used. Only tapes, adhesive film and textiles currently approved may be used (see Approved Tapes and Approved Textiles below). Where the use of paints is agreed with NML (see Display Case Schedule), these should be approved water-based emulsion paints applied to a pre-“keyed” surface. Only primers approved and agreed with NML can be used (see Approved Paints below), and shown to be for ‘Permanent’ use by Oddy Testing will be accepted.
- 3.2.4 Formaldehyde free MDF (e.g. Medite ‘ZF MDF’) may only be used as per the Design Schedule and with prior agreement of NML. This must be covered with an impermeable heat-sealed barrier film such as Moistop or coated with four coats of Dacrylate™ (or agreed alternative) water based (non-V.O.C. emitting) acrylic lacquer, as agreed with NML, and wrapped with NML approved fabric. Fabric should be fixed using approved tapes, and the barrier film over ZF MDF should not be punctured i.e. fabric should not be stapled. For approved tapes and adhesive film see below.
- 3.2.5 Metal panels of mild or stainless steel with powder-coated finish may be used as per the Design Schedule and in agreement with NML. Surfaces should be properly degreased and

corrosion free prior to powder coating. The powder-coating system and process must achieve fully inert, fully cured finish.

4 Approved Tapes

These can also be used, where appropriate, for securing approved textiles over dress panels. The following tapes have been tested as safe for permanent use within display cases:

- Gudy 870 transfer adhesive
- Lomacoll double-sided mounting adhesive
- 3M 415 double-sided tape
- 3M 425 Scotch aluminium adhesive tape

5 Approved Paints & Other Coatings:

5.1 Laquers

Only water based acrylic lacquer can be used that has passed a 'Permanent' for use by Oddy Testing. See 4.1.4 above for use of Dacrylate™ (or agreed alternative) water based (non-V.O.C. emitting) acrylic lacquer on ZF DF.

Adequate drying time between applications as recommended in the manufacturers instructions. Once application is complete a minimum period of two weeks is required for full drying and off-gassing prior to installation within a display case.

The following water-based lacquers are approved for use:

- Dacrylate

5.2 Paint Primers

To be updated

5.3 Paints

To be updated

6 Object Mounts

6.1 Interface layers

Interface layers are used between the mounts/plinths and the objects to provide support, improve surface friction or prevent sticking to painted surfaces.

Materials to be used as required:

- Melinex sheet
- Plastazote (polyethylene nitrogen blown) foam, grades HD45, HD33, HD24, HD18
- Tyvek

- Silicon catheter tubing, Platinum cured (clear, wall thickness no more than 2mm). Used on armatures, rods or edges where they come into contact with objects surfaces.
- Stainless steel cabling must be coated e.g. Bowden cable (ferrules to be used), as per Design Schedule and to agreed safety standards for load-bearing.

6.2 Object mounts

6.2.1 The following materials approved for construction of objects, as indicated in the Design Schedule and agreed with NML:

- **Acrylic rod**, clear cast or extruded acrylic e.g. Perspex and generic equivalents. Colours and surface finishes as agreed with NML (see Design Schedule)
- **Acrylic sheet**, clear cast only e.g. Perspex and generic equivalents. Colours and surface finishes as agreed with NML (see Design Schedule)
- **Stainless steel (grade 304/316)** – as flat straps or rods as required. Brushed finish as standard. Surface finishes and coatings as agreed with NML (see Design Schedule)
- **Mild Steel**. Where this is required for heavier duty load-bearing mounts and brackets this should be finished in an approved paint coating for aesthetic consideration and to prevent surface corrosion. Where water-based paints are used a drying and off-gassing period of 2 weeks is required prior to installation. Where solvent paints are used, as agreed with NML, a period of 4 weeks is required for drying and off-gassing prior to installation. Colour should be as per Design Schedule and as agreed with NML.
- **Silicon catheter tubing**, Platinum cured (clear, wall thickness no more than 2mm). Used on armatures, rods or edges where they come into contact with objects surfaces.

6.2.2 Object support pegs. Set into holes within backboards or support surfaces to stabilise objects. These can either be:

- Acrylic rod, cast or extruded. As agreed with NML (see Design Schedule). Where Tensol 12 Acrylic Adhesive™ or similar solvent-adhesive is required for bonding acrylic to acrylic, a minimum off-gassing period of 4 weeks is required prior to installation.
- Stainless Steel with silicone rubber catheter tubing sleeve to provide padding and prevent scratching and bimetallic corrosion when supporting a metal object. As agreed with NML (see Design Schedule).
- **Silicon catheter tubing**, Platinum cured (clear, wall thickness no more than 2mm). Used on armatures, rods or edges where they come into contact with objects surfaces.

6.2.3 Other object support fixings

- **Acrylic**. Where other supports surfaces are required, such as curved support strips consideration should be made as to the use of additional fixings for load bearing, aesthetic appearance. Where Tensol 12 Acrylic Adhesive™ or similar solvent-adhesive is required for bonding acrylic-to-acrylic, a minimum off-gassing period of 4 weeks is required prior to installation.