

Polydur™ Tooling System

Application

- Moulds from Clay Models
- Architectural Mouldings
- Film & TV sets
- Fast Laminates
- Drape tools
- Jigs

Properties

- Very accurate
- Very Low hazard
- Water based
- Fire Retardant
- High Temperature Resistance
- Low CTE

Physical Data

Property	Polydur LG	Polydur Emulsion EM25
Composition	Calcium Sulphate Hemihydrate	Acrylic Copolymer in water
Form	White Powder	White Liquid
Density @ 20°C	2.6 g/cm ³	1.055
Viscosity	N/A	200-450 mPas
PH level	N/A	4-5.5
Heat resistance	>120°C	
Co-efficient of linear expansion	10 ⁻⁶ K ⁻¹	
Mixing Ratio	100	50

Processing

Mould/Tool preparation

Models should be prepared in the usual way as with any resin system. 818 mould release has been found to be successful with most materials (except styling clay) and applied by soft cloth and polished after solvent evaporation. A minimum of two applications is recommended.

818 can also be used to take Polydur™ laminates from Polydur™. The Polydur™ laminate requires no sealing, but three applications of 818 are advised.

Styling clay requires special consideration and varies with different styling clay products; suppliers should be able to make recommendations in respect of this. JBB Styling Release has proved suitable for most styling clays but tests should be done with individual styling clay types to determine suitability. Kolb Claypeel has also proved suitable for taking epoxy faced laminates from clay.

Gel Coats - Polydur™ Surface SGP/L

It is important that the powder (SGP) is added to the liquid (SGL) and is mixed mechanically. This will produce a creamy thixotropic mix, which should be applied with a soft longhaired brush.

A 500gm mix covers approximately 0.4m.

It is only necessary to 'paint' a thin layer, as this is subsequently 'wet out' with the same material in the Polydur™ laminate. It is suggested that it be applied more liberally in corners to aid subsequent laminating. The main function of this surface (unlike conventional gel coats) is only to keep the glass layer from the surface of the tool.

This thin layer will cure (dependent upon temperature) within 30 minutes and will be observed to turn uniformly white. Laminating can be commenced at any time after this, giving ample time to prepare for the laminating procedure

Epoxy Surface S15/S15R & Coupling Coat J-K99 / JB 404H

Where required Polydur™ tooling can be produced with an epoxy surface and S15/S15R has been especially formulated for this application. Conventional epoxy gel coat procedures should be used and Polydur™ laminating should be commenced at the tack free stage. The condition of the S15/S15R surface is critical to ensure bonding with the subsequent Polydur™ laminate. For larger surface areas a coupling coat is recommended and JB-K99 / JB-404H has also been specially formulated for this application. Polydur™ laminating can be applied to a wet JB-K99 / JB-404H surface. Slight exotherm occurs with JB-K99 / JB-404H, which aids S15/S15R cure and is usually de-mouldable within 2-3 hours dependent upon temperature.

It is recommended that during the application of S15/S15R an 'off the job' area is gelled in order to determine de-mould time.

Laminating

Prior to laminating, the Polydur™ gel coat SGP/L or JB-K99 / JB-404H/S15/S15R surface should be 'wet out' with the laminating mix, Polydur™ LG/EM25, to ensure bonding of the gel coat to the laminate.

Polydur™ Emulsion EM25 and Polydur™ LG are mixed by first adding the powder to the liquid. It is suggested that a typical total mix should be 1500gm (1000gm LG / 500gm / EM25), and for larger laminates 3000gm (2000gm LG / 1000gm / EM25).

Mechanical mixing is recommended.

The result is a low viscosity mix, which will wet out fabrics, chopped strand mat or Neomat.

1500gm mix laminates 0.5m² using 300gm Neomat.

A typical laminate of two layers of 300gm Neomat should weigh approximately 8.0kg / m² maximum. Weights higher than this denote excess resin to glass ratio. 300gm Neomat is recommended for most applications and large areas can be covered quite quickly. It can be observed that Neomat has a looped side. When using two layers, it is suggested that the layers should be loop side to loop side. If three layers are used, the third layer should be loop side down in order to have a smooth back surface. Care should be taken as with any resin system not to 'over wet' the glass. Any excess should be rolled out, using a lamb's wool type roller which can be washed out in water after use. Neomat should be 'wet out' off the job

As Polydur™ adheres to itself at any time, there is not the usual constraint in timing when laminating the first layer. A uniform laminate thickness is important. Overlapping of laminates should be avoided because thick and thin sections may lead to distortion of the laminate, as with other resin systems. Whilst little or no exotherm occurs with the system using two layers, thick sections may cause local exotherm. Two layers of 300gm Neomat are considered suitable for most laminate requirements.

On laminates where added rigidity is required, this can be achieved by local stiffening ribs. These can be produced by laminating one strip of Neomat over pre-cut foam strips, to form a box section, again avoiding excess resin. Particular attention must be paid to flanges because these aid subsequent de-moulding and add rigidity and stability to the laminate. Honeycomb foam sheet is ideal for this application.

The Polydur™ laminating system requires 20°C for optimum results. At this temperature, the laminate will be observed to cure within 2 to 3 hours by turning uniformly white and can be de-moulded at this stage. De-moulding is best achieved by using air pressure through holes or valves in the laminate to relieve the vacuum produced. To avoid damage to the model by drilling such holes, these are best provided during laminating. Suitable size pegs or valves can be placed on the model and laminated around, leaving valves in situ or pegs that can be removed. On de-moulding, it will be observed that the gel coat is no longer white. This requires a further 2 hours to cure, at which time the laminate can be considered cured and ready for use.

Storage and Handling

See Material Safety Data Sheet

Disposal Consideration

Product: Must be disposed of in a special waste disposal unit in accordance with the corresponding regulations.

Packaging: Completely emptied packaging can be given for recycling. Packaging that cannot be cleaned should be disposed of as product waste.

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