

Materials Technical Guidelines



For more information, email technicalshypetex.com



Hypetex Material Storage Guidelines

Hypetex coloured carbon fibre is sent as a dry fabric and is not subject to varying weather conditions.

It is recommended that the material is kept at a consistent temperature and humidity. The recommended temperature is 15-25°C and at less than 70% relative humidity.

- Do NOT lay the roll of carbon fibre on any surface as the weight of the material itself can damage the material.
- Do NOT stand the roll of material vertically on its core as this will distort the material. Instead keep the material on the roll provided and hang on a dispenser stand.

In prepregged form, the resin system manufacturer's recommendations are to be referred to. Hypetex recommends storage at -18°C for long-term storing and at least -5°C for short-term storing. The prepregged material must be tightly sealed within its plastic bag and a cardboard box.

For short-term use (less than 4 weeks), material should be defrosted within its plastic sleeve to avoid any dew to form on the surface of the prepreg.

Prepreg suppliers should provide dew point temperature tables giving dew temperature thresholds depending on temperature and relative humidity of the room.



Hypetex Material Handling Guidelines

Hypetex recommends the use of material handling gloves to eliminate the cross contamination from human skin and oils to the surface of the material.

Hypetex materials must be handled with caution as it displays different physical properties to normal carbon fibre. Care must be taken when bending or manipulating the material and avoid stretching as this can warp the weave, show 'zebra lines' and potentially lead to inconsistencies in the colour.

Carbon fibre can cause skin and eye irritation therefore proper safetywear must be worn, such as gloves and safety glasses.

Automated cutting machines can be used, though it is up to customers to adjust the cutting parameters according to their equipment. Some adjustments will be required and Hypetex recommends adjusting these on a small batch of the material beforehand to best define the required parameters.

Tooling

The tools should be constructed from materials that will retain their dimensional stability at the intended processing conditions, i.e. curing temperature of the resin, curing pressure, number of parts made from each tool.

For a perfect finish, the visible surfaces of the tool should avoid having any visible damage marks, dents, joints, inserts or scratches. Any imperfection seen on the surface of the mould will directly translate to the same imperfection on the surface of the part.

There may be ways to improve the surface of the mould, such as using surfacing films which will smoothen small imperfections. The use of surface films should be considered during the part's design stage to compensate for its thickness, particularly for dimension-critical parts.

Depending on the process chosen for curing the part, a vacuum leak test should be performed prior to applying any material on the surface of the tool.

It is especially important that the mould is properly cleaned after every use before any lamination.

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Hypetex Layup Guidelines

Hypetex fibres can be used in several methods including wet layup, prepreg, RTM, RIM, hot melt, resin infusion, vacuum infusion and compression moulding.

It is recommended to use vacuum infusion or prepreg for the best results.

Hypetex recommends performing a debulking process of the prepreg layers in order to guarantee good adhesion to the tooling along with ensuring good adhesion to the layers underneath.

This debulking should be carried out even on flat surface to provide an “invisible” seam.

Debulking should be performed a maximum of every four layers to limit the amount of air trapped in between the layers.

Perforating the prepregged layer prior to laying them up can be done to help with air removal, trapped when prepregging and sealing, this can be done using the rollers seen below.



The usage of these rollers must be done with care as there is a possibility for the fibres to break.

Make sure all mould surfaces that come into contact with the fibre is cleaned thoroughly. If any imperfections are found in the mould surface, consider using a surfacing film to smoothen out any issues with the mould.

Depending on the process a vacuum leak test must be performed before the commencement of the manufacturing process.

It is recommended to apply a suitable release agents and or a peel ply as appropriate to make the separation of the part from the mould easier.

Hypetex suggests the use of chemical release agents or release films over waxes as these are easier to apply and form a sufficient barrier between the material and mould.

Resin systems

It is recommended to use a thermoset epoxy based resin.

Curing

User should follow the instructions of the laminate resin TDS as recommended by the supplier. It is suggested to cure at nominal temperatures as mentioned in the resin TDS, this will provide better quality in terms of finishing thanks to the lower thermal distortion of fibres, and less yellowing of the resin system.

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Hypetex Finishing Guidelines

Once cured, the part can be removed from the mould and prepared for finishing.

Hypetex recommends the usage of chemical preparation agents and light abrasive preparation.

It is important to limit the risk of breaking fibres and decreasing the strength of the final part.

If the abrasive preparation of the part is needed, a sacrificial layer of glass can be used between the tooling and the Hypetex carbon.

During the sanding process, the layer of glass will be sacrificed to provide a smooth finish without damaging the carbon fibre.

This layer of glass fibre should be as thin as possible for the best transparency. A veil or fabric can be used if it is lower than 30gsm in fibre areal weight. It will also provide a pinhole-free surface thanks to its low-crimp surfaces.

We recommend using a glass fibre veil as the layer of sacrificial protection as pictured below.



Recommended products for finishing

Hypetex coloured fabrics cannot be abraded as normal as this removes the colour. Prep lightly with 320 grit sandpaper and red scotch by hand. Pre-cleaning is done following the normal process.

Lechler/Carbo Clear Process LS143 (29143) ACRYL 2K*

- Please read data sheet before use
- 2x wet on wet coats, 5 min flash between coats, 15 min flash before bake 40min @ 70°C
- After first application has been completed, normal processes are to be followed

Oxeco Kotefast Surface finishing

Kotefast treatment is used as a surface preparation prior to painting or lacquering of polymer composite substrates. Kotefast can be sprayed or rolled onto a surface and is activated by curing, either in a convection oven or by infra-red. Kotefast is an alternative to mechanical abrasion (sanding, grinding and even vapour blasting/plasma treatment). Please refer to the technical data sheet for the application guidelines. <https://www.oxeco.co.uk/resources>

Glass fibre veil for sacrificial protection

Technical Fibre Products (TFP). Different veils can be chosen depending on the purpose of the final product. <https://www.tfpglobal.com/products/composite-materials>

Please contact technicalshypetex.com for further technical information.