



**Your vision,  
our expertise**



# Moulding the Composites Industry

Patterns & Moulds transforms ambitious concepts into reality for clients in the composites industries.

Combining technically advanced machinery & systems with the problem solving skills of our expert craftsmen, we deliver practical solutions to your project no matter how complex or innovative.

Celebrating 50 years in business in 2017, privately owned, employing over 30 skilled & semi skilled operators, Patterns & Moulds has a reputation for precision, expertise & innovation. Continued investment in plant, machinery & training ensures we maintain and enhance this reputation, always being ready for the next challenge.

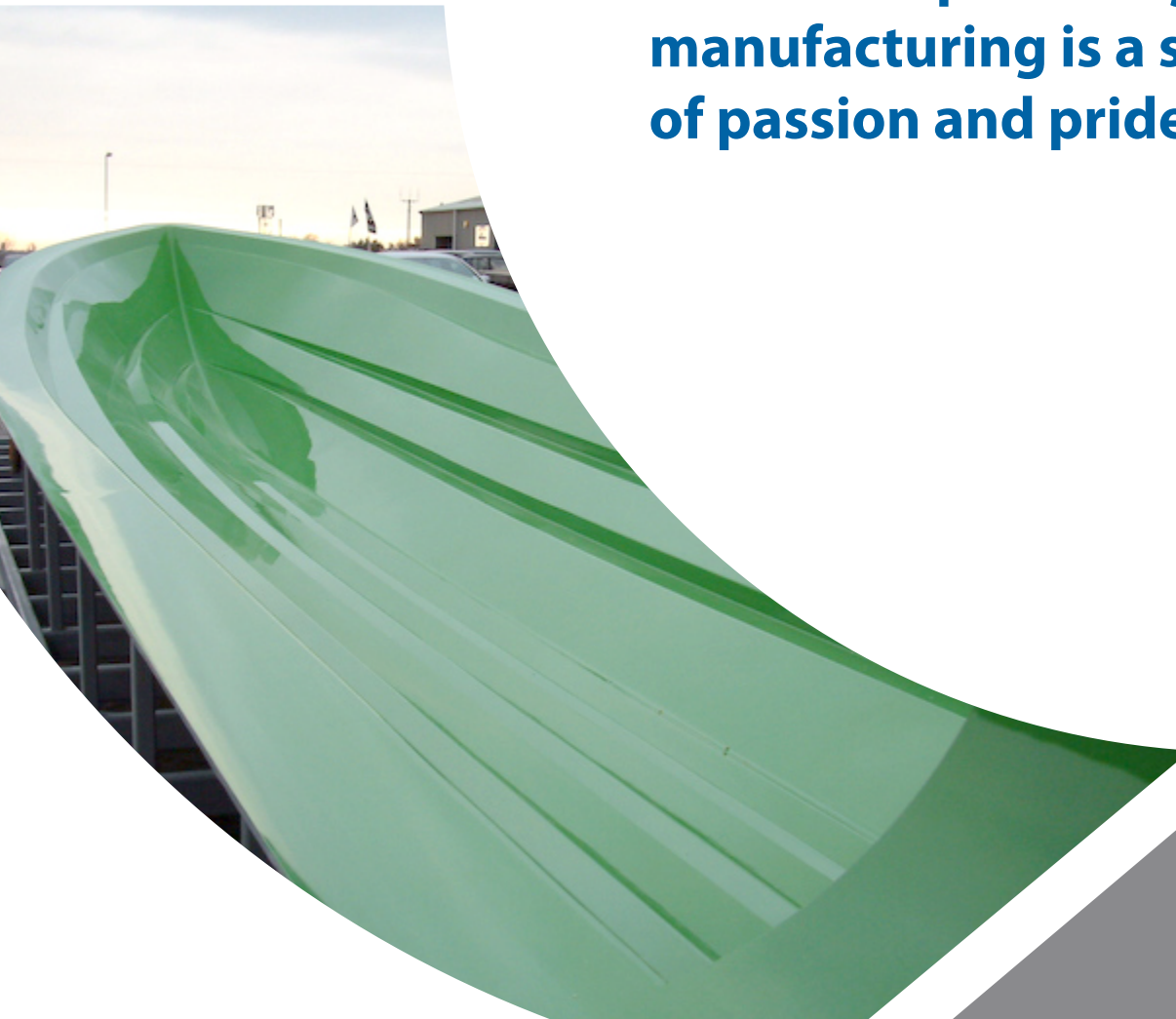
Taking your idea from a rough sketch to CAD drawing or 3D model, we can progress to rapid prototyping and quality production mould or even precision production run. Our work is limited only by the imagination of the architects, designers, engineers & clients who engage our services.





**“ We’ve worked on some of the most prestigious & iconic projects in the UK and Europe and our relationship with high-end manufacturing is a source of passion and pride”**

**Gary Lucas**





**Poseidon** **CMS Cms**  
advanced materials technology

# State of the Art Machinery

We offer 5 large scale CNC Routers supported by advanced CAD Cam software to cover all of your CNC Machining and CNC Tooling needs.

All 4 machines have been manufactured to our own specifications and include full remote monitoring and diagnostic systems. Our largest machine, a CMS Poseidon 5 axis at 13 x 5 x 2.5m with 162.5m<sup>3</sup> capacity & 16 tool ATC is one of the largest machines in the UK. Our remaining machines vary from 7.5 x 3.5 x 1.5m to 2.6 x 1.6 x 1.2m, all with auto tool changers.

We can work from your designs and 3D CAD models, or designs and drawings we've produced in consultation with you. We can provide CAD models for you to approve. By using 3D laser scanning, which generates the necessary CAD data, we can also work from any physical object you provide. With near unlimited CNC Machining capabilities we offer basic profiling of sheet materials through to full CNC Machining of complex pattern and tooling equipment as well as 3D forms and prototypes, to tolerances of just 0.25mm.





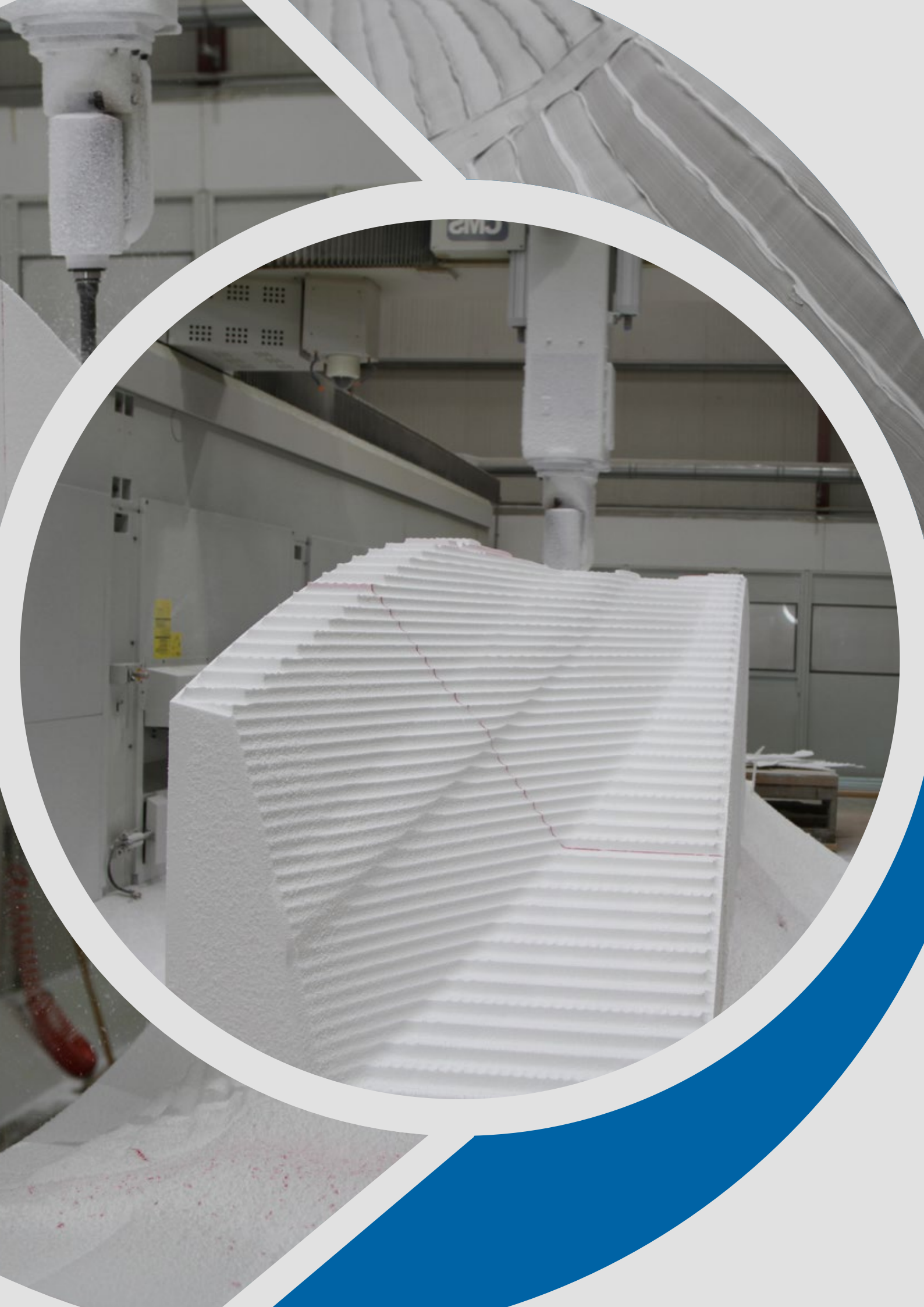
# Seamless Modelling Paste

To achieve the ultimate seamless surface for tooling we have embraced the seamless modelling paste method of manufacturing tooling.


Using Epoxy based pastes through our own application machine ensures we can respond to projects immediately, meeting the tight timescales so often required.

Expanded polystyrene offers a cost effective and stable substrate and following good practice of skinning the polystyrene with a glass laminate and a controlled post cure ensures we achieve stable and consistent surfaces for machining and finishing.

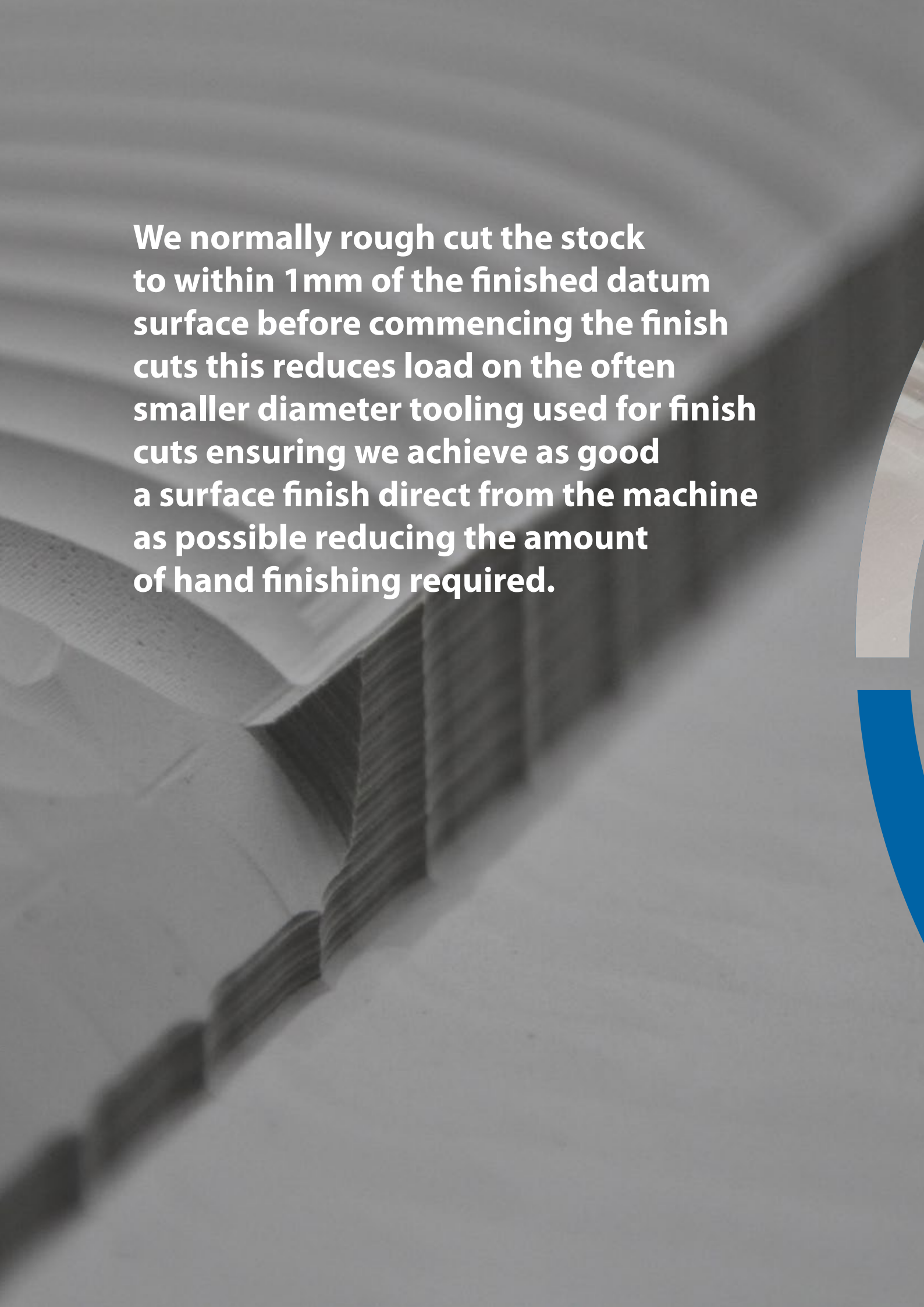




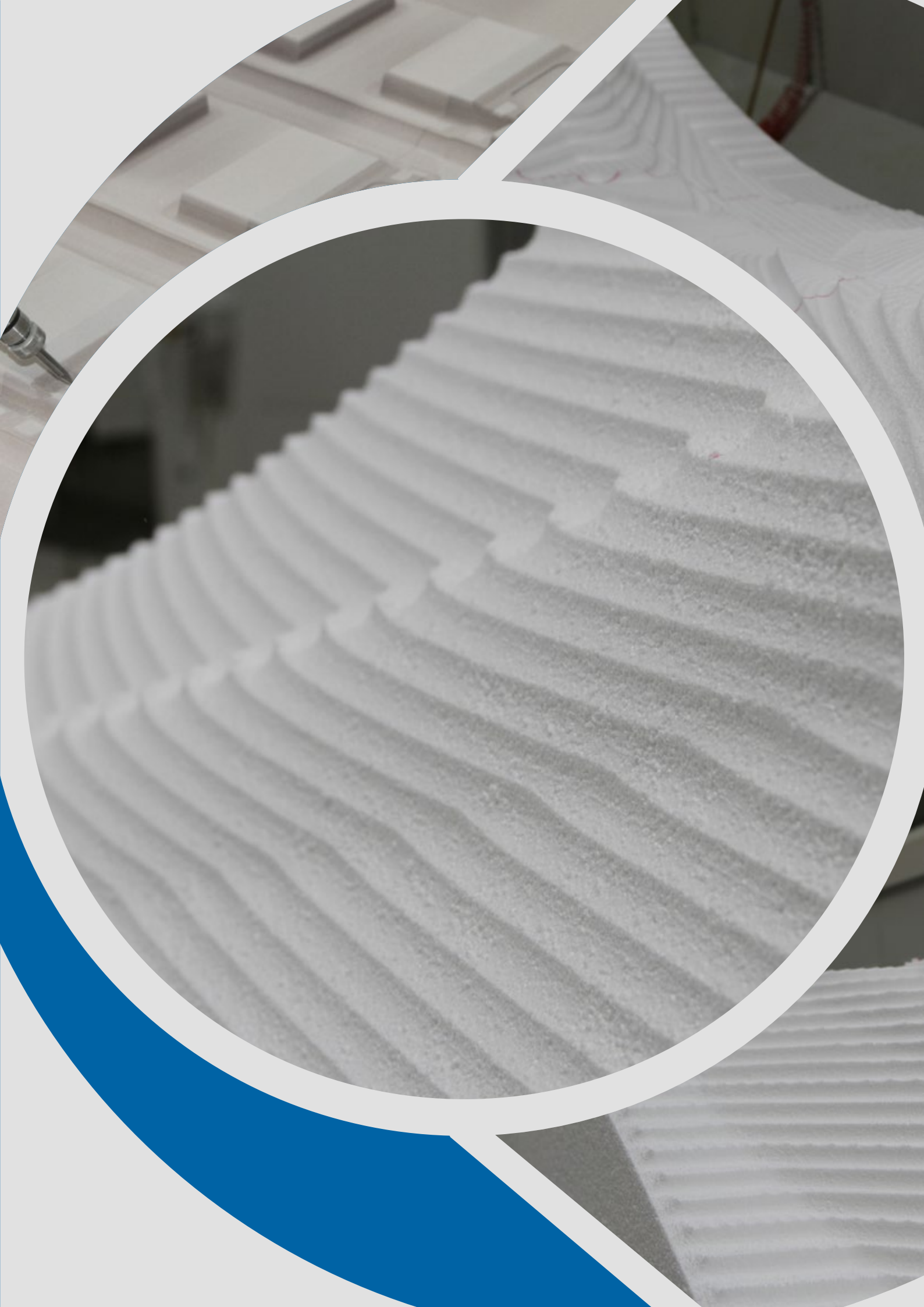


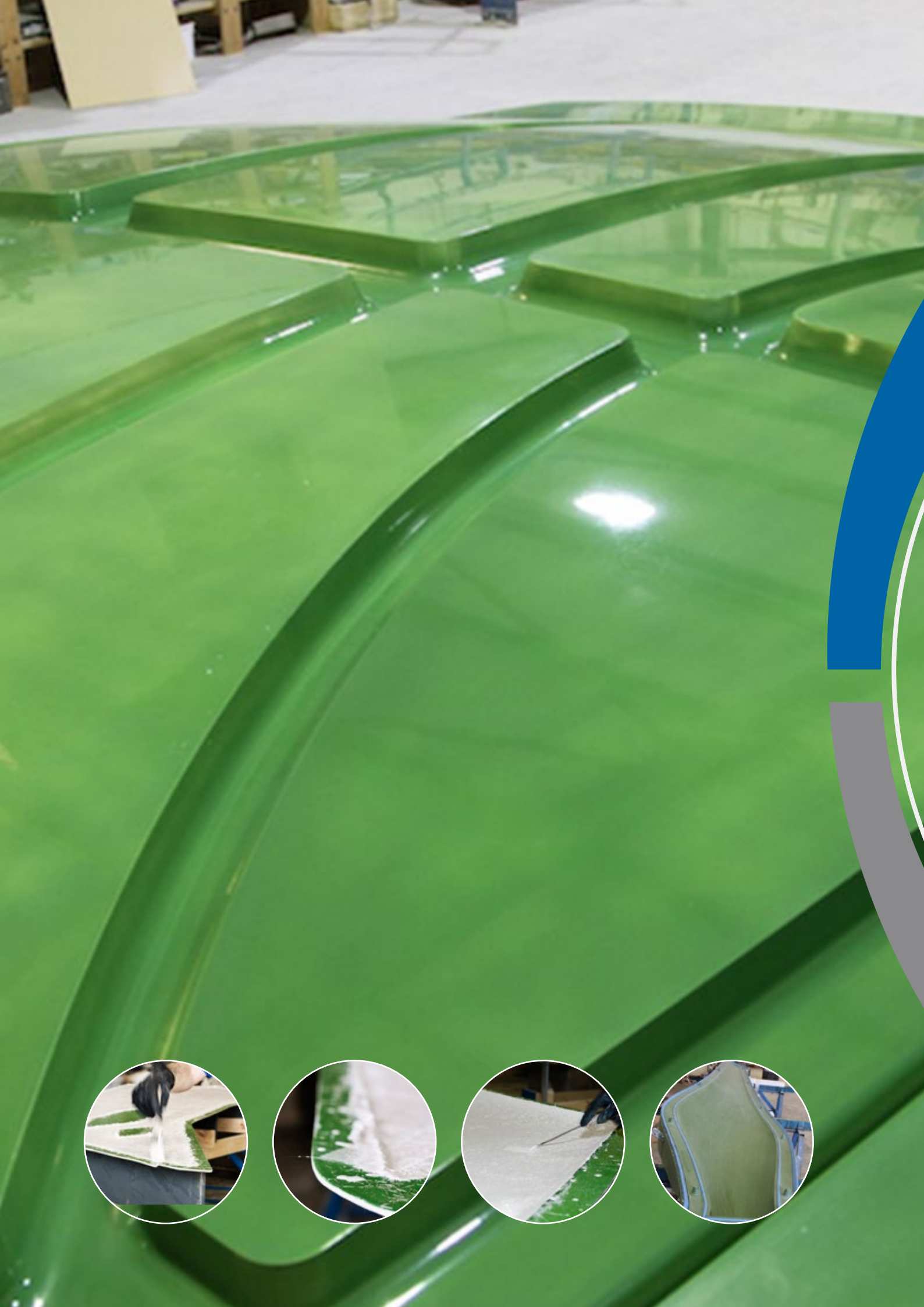


**The polystyrene substrate being cnc undercut typically to minus 10mm, before the glass laminate skin is applied ensuring a vacuum integral skin when required prior to the seamless paste being applied and post cured.**

A close-up photograph of a metal cutting tool, likely a lathe tool, in the process of machining a cylindrical workpiece. The tool is positioned on the left, and the workpiece is on the right. The cutting edge of the tool is visible, and it is creating a smooth, finished surface on the workpiece. The background is blurred, showing the metallic surfaces of the machine. The text is overlaid on the left side of the image.

**We normally rough cut the stock to within 1mm of the finished datum surface before commencing the finish cuts this reduces load on the often smaller diameter tooling used for finish cuts ensuring we achieve as good a surface finish direct from the machine as possible reducing the amount of hand finishing required.**








# Composite Tooling

From your required production method or material requirements, we can assist with the mould design from concept to completion, including laminate schedules and full FEA analysis of the mould design.

Manufacturing fabricated steel frames for the support of the moulds allows ease of transport and maintains the accuracy during its production life. Tooling can be tailored to suit the numerous manufacturing methods utilised today.

These images show full Epoxy resin gelcoat and laminate mould tool for carbon prepreg yacht sunroofs. Typically most tooling is produced using Vinyl Ester gels and initial skin layers backed up with Rapid tooling system laminate.



**Multi part GRP mould tools produced fully from tooling system materials with each part produced separately from individual master patterns, to speed up the overall manufacturing period. The accuracy of CNC machined master patterns allows this solution to work, with each section coming together with the designed mould location details positioning the individual sections successfully.**



# Hitachi Class 800 / 801 Intercity Express Programme

Showcasing our unrivalled in house 'one stop shop' utilizing our state of the art 5 axis CNC machines alongside traditional skilled craftsmen.

Using production CAD supplied by DCA Design International from the original Hitachi Rail Europe supplied CAD, we produced master patterns & moulds to create the tooling for the GRP panels for the cab exterior and carriage interiors.

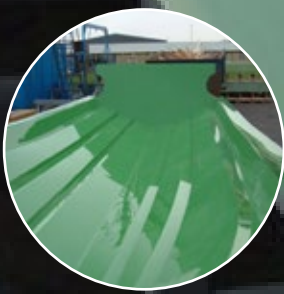
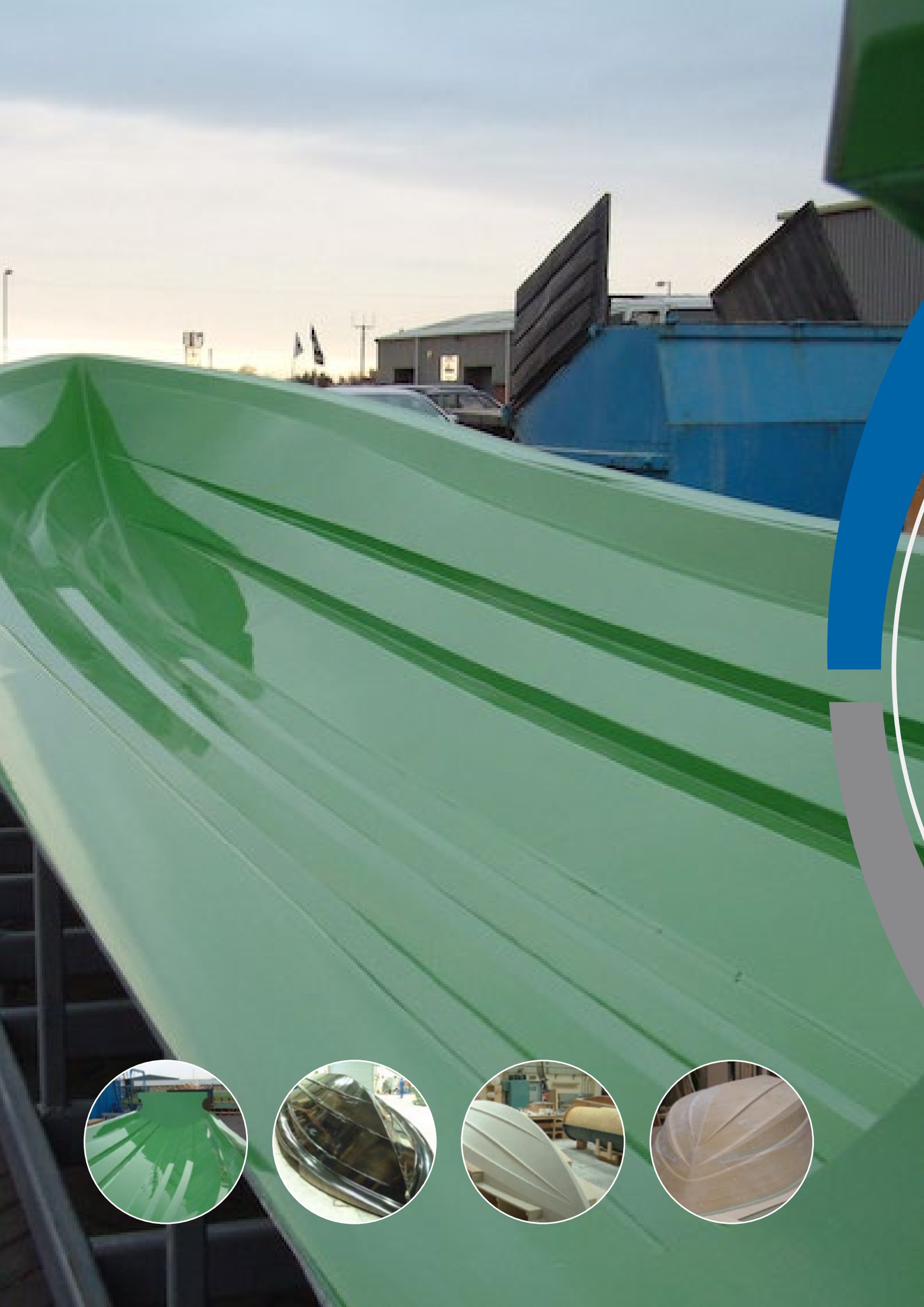
The mock up has been used by Hitachi Rail Europe in finalising the interior form and function of the new train and promoting its use on our railways.







Images kindly  
supplied by  
DCA Design  
International



# GRP moulding for hulls

Master patterns produced in either MDF or seamless modelling paste, for the manufacture of GRP production moulds for the hulls of RIB boats and smaller day craft.

Sizes shown here vary from 5 mtrs to 12.5 mtrs. The entire patterns being CNC machined before being coated and hours of time spent achieving the required high gloss surface finish.

GRP moulds are produced using both Vinyl Ester and rapid tooling systems resins to ensure stability and achieve the required long term high quality surface finish.

# Butlins - Skegness GRP Component Production

Patterns and Moulds have evolved our GRP department into the manufacture of finished GRP components, serving many different & challenging market places from construction to internal fit out.

Having undertaken full 3D design, we manufactured over 70 GRP panels of numerous sizes and shapes for these rope bridge pods and platforms.

Our in house capabilities including design, tooling production & finished component manufacture gives us total control of a project from start to finish, including site erection if required.

Production can be undertaken in any of the following manufacturing methods: Polyester resins as required from general purpose through to fire retardant, vacuum infusion, closed mould, vinyl ester and epoxy resin hand laminating.



# Business coming together to support



**'The ski seat has given me the confidence to throw my body into corners at speed and know when I ask the ski to move it does it instantly and in the right way. This is due to the time the team spent getting the fit correct and understanding what we needed to improve our performance.'**

Steve Arnold – Para Nordic Skier.











# Restoring Funnels

We were recently contracted to produce this replica boat funnel for a restoration project.

We manufactured the cnc machined direct mould tools required and laminated the GRP funnel sections, bonding these sections together prior to delivering to the customers spray shop for final finishing.



# Crossrail - Elizabeth Line, London

P&M produced hundreds of CNC Machined direct moulds in MDF, Model Board and Seamless Modelling Paste, along with Master Patterns and GRP Moulds for the cladding panels to the platform and pedestrian tunnels on three of the new Elizabeth Line, Crossrail Stations: Tottenham Court Road, Liverpool Street and Whitechapel.

With complex double curving forms requiring high levels of accuracy, only achievable from CNC machining, these tools are helping create a vital transport link that will be used daily by thousands of people.



Exit Route  
Please Follow the Exit Signs  
→

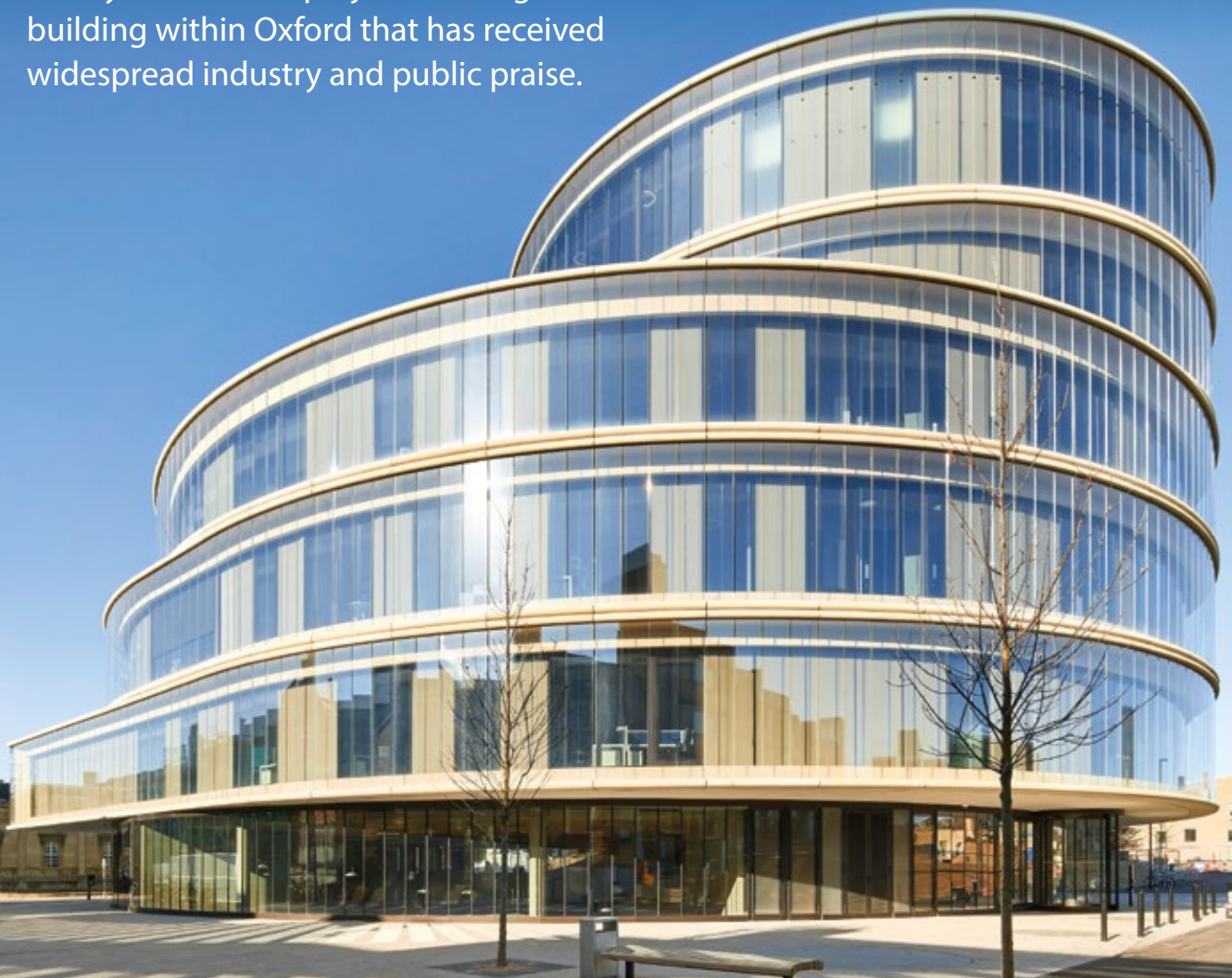


Images courtesy  
of © Hufton +  
Crow / View

# Blavatnik School of Government - Oxford University

We were engaged early on this project by the Architectural team Herzog & De Meuron having worked closely with them earlier on the construction of similar elements at the new Tate Modern 2 building at Bankside London.

Working closely with Laing O'Rourke / Expanded, our work included the design and manufacture of CNC machined timber and GRP moulds and shuttering to internally form all the curved stair flights and balustrade walls and externally the bull nosed edgings above and below all the glazing panels. A truly memorable project creating an iconic building within Oxford that has received widespread industry and public praise.



If you would like to talk to us about  
your project or need advice,  
please call us on 01509 881581

If you'd like to visit then you'll find us at:

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