Always at the core of your solution

Diab

Finishing

ENHANCING QUALITY & PERFORMANCE

diabgroup.com

OPTIMISE EFFICIENCY, COST, WEIGHT AND QUALITY

Accuracy in every cut

Finishing refers to the controlled machining of structural core materials. Precision cuts, grooves and perforations are introduced to adapt the core to specific production requirements. These modifications allow the core to follow complex curvatures and ensure optimal process reliability, resin distribution, and structural integrity regardless of your chosen manufacturing method. Ultimately, a stronger end-product with lower weight has a positive environmental impact.

Streamline your production

Selecting the optimal finishing method elevates application quality and streamlines manufacturing:

- **Formability:** Adapts seamlessly to mould surfaces with minimal spring-back.
- **Weight reduction:** Optimises final part weight through engineered grooves and perforations.
- **Faster resin flow:** Ensures secure and rapid distribution in vacuum infusion.
- **Evacuates air:** Ensures thorough air evacuation in vacuum infusion or vacuum bonding operations.
- **Surface excellence:** Improves the finish of final parts.
- **Cost efficiency:** Reduces resin inlets and eliminates the need for additional flow media.

Unrivalled finishing expertise

With decades of experience, Diab is a world leader in developing finishing solutions. Our deep technical knowledge across all manufacturing methods ensures your finishing is perfectly fit for purpose.

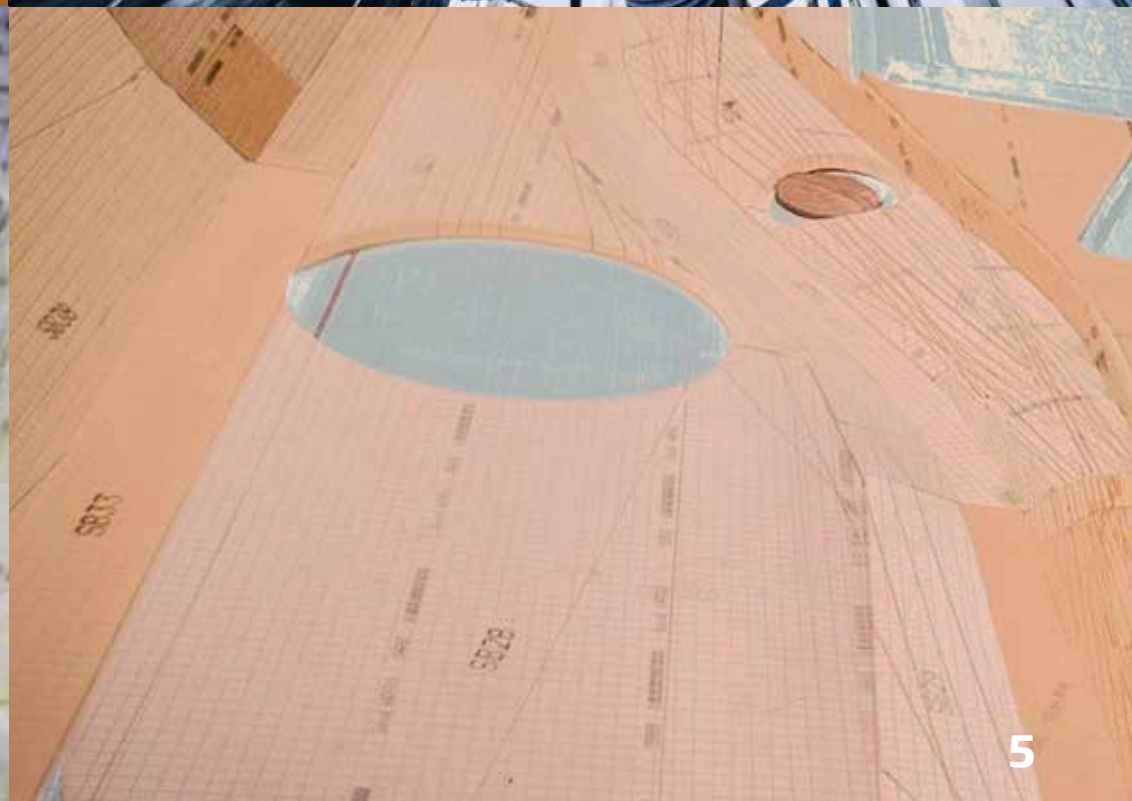
AN OPTIMISED FINISHING FOR EVERY GEOMETRY AND PROCESS

Expert guidance for your manufacturing method

The complexity of your component and the curvature of the mould influence which core finishing fits best into the mould shape with a minimum of spring-back and reduced resin consumption. Together with the geometry and expected performance of the product, it is crucial to analyse the finishing used for each manufacturing method.

The manufacturing process defines the ideal finishing for form and flow:

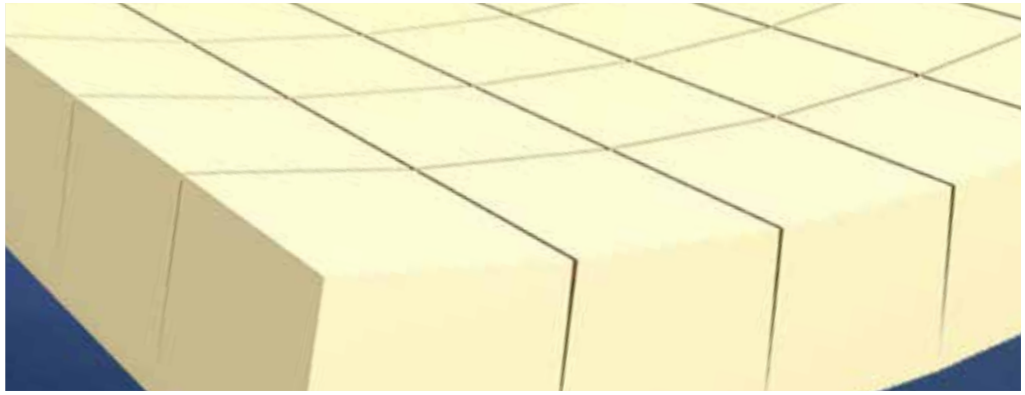
- **Wet Lamination:** Typically, formable finishing cuts with or without glass fibre backing are used to ensure the core adapts to the mould surface perfectly. Weight is usually not the most critical factor in this process.
- **Vacuum Infusion:** Core finishing selection for proper resin distribution on both sides of the core is vital. We identify the optimal combination of grooves and perforations to facilitate fast and robust resin flow while ensuring the desired surface finish.
- **Resin Transfer Moulding (RTM):** Includes two stiff counter moulds. Here, perforations are typically used to evacuate air and ensure reliable resin distribution across the part.
- **Prepreg:** Used for weight-critical components, often with thin carbon laminates. Perforations are utilised for air evacuation under vacuum consolidation to ensure adhesion and laminate quality.



TAILORED SOLUTIONS FOR COMPLEX GEOMETRIES

Find your ideal finishing

To achieve a flawless fit and efficient manufacturing, the finishing must match your specific design challenges. We partner with you to select the modification that best supports your performance goals and production flow.

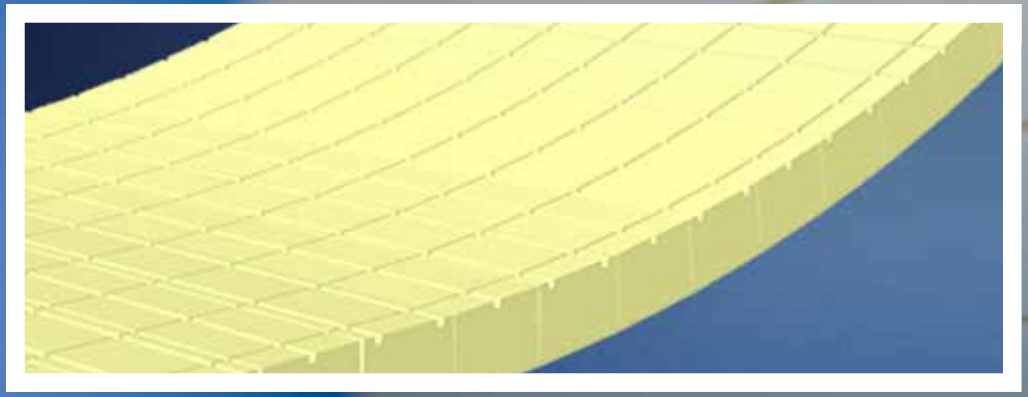


Flow finishing

Cuts or shallow grooves on the core surface allow the resin to distribute and wet out the laminate. Perforations allow air evacuation, and in a vacuum infusion process, they will transfer resin from one side of the core to the other, ensuring proper laminate wet-out. These are also used when working with prepreg or core bedding adhesives to secure proper bonding to the laminate.

Form finishing

To create curves, you have formable finishing options specifically suited to fit the needs of single and double-curved geometries. These unique solutions ensure you can get the best performance out of every design with a minimal of spring-back. They include cuts designed to follow the mould surface in the most common applications.



Flow & Form finishing

A combination of Flow and Form options is essential when you need to adapt to the curvature of your product and distribute resin efficiently during your manufacturing process. These finishes can be successfully combined to facilitate fast and robust resin flow for curved areas while maintaining high surface quality.

Tight tolerance finishing

Tight tolerance can be achieved by machining the core in different ways depending on demand. One finishing option includes extremely narrow thickness tolerance with a very smooth surface finish, allowing for low resin consumption in the lightest weight requirements.

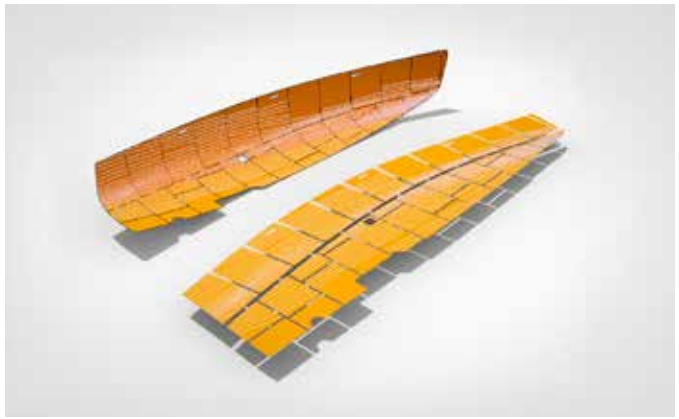
DIAB ENGINEERING SERVICES

Unlocking the full potential of composite design

Diab Engineering Services provides expert support in your kit design, from material selection to testing, helping you move seamlessly from idea to production. With guidance from our Composite Consulting Group (CCG), we enable lighter, stronger, and more sustainable composite solutions.

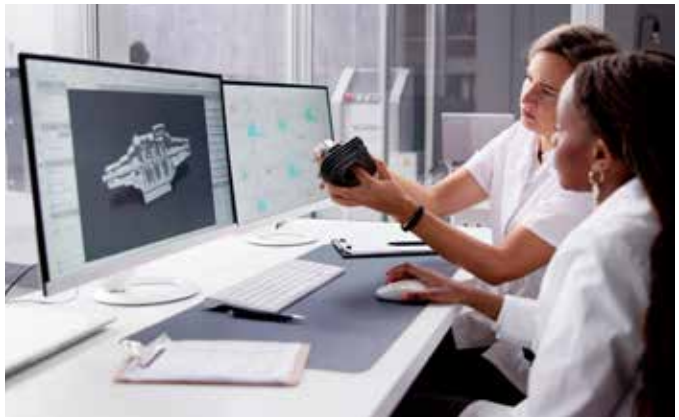
Proactive product and process support

We support you in selecting the most suitable core material for your application, offering a wide range of finishes tailored for form or flow. Our expertise includes analysing and identifying the optimal finishing for each manufacturing method, along with providing guidance on various manufacturing processes.



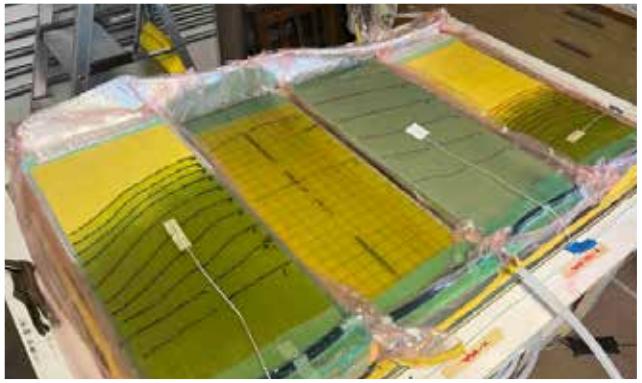
Innovative kit design and engineering

We offer in-house developed tools for optimised design and ensure a direct connection between our engineering department and yours. Our standard kits are designed to meet your needs for speed and efficiency, while our advanced kits deliver maximum weight savings, high performance, and even more reduced CO_2 emissions.



Industry-leading composite consulting services (CCG)

Our world-class engineering expertise covers every step of the composite development process – from laminate design and structural engineering to detailed composite design including drawings. We offer advanced flow modelling for closed moulding, efficient tooling design, smooth prototype production, and flexible short production runs.

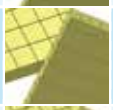
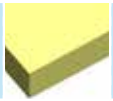
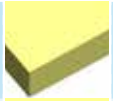


Hands-on training (CCG)
We offer both theoretical and practical composite training focused on materials and processing, including specialised infusion training for start-ups or process improvements. Our long-term experienced team supports you every step of the way.

Process support & optimisation (CCG)
We provide detailed analysis of various manufacturing processes, along with optimisation of process and factory flow to enhance efficiency and productivity.

Comprehensive testing
We support your development with comprehensive material and component testing, proof of concept evaluations, and detailed material characterisation. Field tests are also conducted to ensure real-world performance and reliability.

SAVE TIME, MONEY AND RESOURCES WITH OUR FINISHING OPTIONS

	Name		Finishing type	Description	Function	Other note
FLOW	PFC, PF20		Perforated	Perforated material with 2 or 3 mm drills in different configurations.	Perforation allows for resin and air to flow from one side of the core to the other, which is useful in vacuum bonding or infusion processes.	For infusion, PF20 perforations are recommended to secure good wet-out.
	GRC, 4, 6 8, S007, S014		Grooved	Materials are grooved in different configurations and with different widths to suit different needs.	Fast and reliable distribution of resin in vaccum-assisted processes for flat or slightly curved surfaces.	Well suited for larger panels and where the core thickness is above 25 mm. Not recommended for applications with high surface finish requirements.
	GPC1, 2, 8, GPL1		Grooved & Perforated	Grooved and perforated material in different configurations, with 1 or 2 mm diameter perforations, suiting different needs in vacuum-assisted processes, such as infusion.	Very fast and reliable distribution of resin in vacuum-assisted processes for flat or slightly curved surfaces. Perforations will transfer resin and wet out both sides of the sandwich. The use of small perforations reduces the impact of print-through when only one side is grooved.	Can be combined with form-finishing options, such as GS, DC or similar, for more complex curved areas.
FORM	GS10, GS30, GS60, GW30, GW60		Cuts with scrim	Grid-scored 30 x 30 mm, alternatively 10 x 10 or 60 x 60 mm, with a glass fibre scrim backing. 0.9 mm wide cuts (GS30) or 1.3 mm wide cuts (GW30).	Cuts will allow the core to easily adapt to the mould surface in most common applications and uses.	Wider spacing between cuts is suitable for slightly curved surfaces. The width of the blade affects the possible curvature, which is also influenced by the choice of core thickness and density.
	DC30, DW30		Cuts	Grid-scored material in two directions on both sides with a slight offset. The 0.9 mm or 1.3 mm cuts are made to 45% of the core thickness.	For slightly curved areas. The offset cut intersections act as conduits for air and resin flow.	Semi-flexible.
FLOW & FORM	Q200, Q201		Cuts & Thin Grooves	A grid-scored, scrim-backed GS with thin, shallow V-grooves centred in the 30 x 30 mm blocks on both sides.	The V-groove crossing with the GS cut acts as a perforation to facilitate fast and robust resin flow and wet-out on both sides of the core on curved surfaces in the infusion process.	The thin V-grooves and GS cuts minimise the risk of print-through.
	Q100, Q103, Q033, Q018, I113, I013		Cuts & Grooves & Perforations	A grid-scored, scrim-backed GS with 2 x 2 mm GPC1 grooving and 2 mm perforation in the grooves. Q100 has 0.9 mm wide cuts, while Q103 has 1.3 mm wide cuts.	Very fast and reliable distribution of resin and laminate wet out in infusion process for curved areas.	Reduced risk of print-through due to the small perforations on the mould side.
	Q300, Q010		Cuts & Perforation	Grid-scored material with glass fibre scrim, featuring 2 mm PF20 perforations.	A fast and reliable distribution of resin in vacuum-assisted processes for curved areas.	Reduced risk of print-through due to the small perforations on the mould side.
OTHER	PSC		NA	Plain sheet without finishing		
	T		Sanded	Sanded for tight thickness tolerance: ±0.25 mm, vs standard tolerance ±0.5 mm.		
	Z		Skiving Tolerance	Specially slitted for tight thickness tolerance: +/- 0,2 mm. Thin sheets possible down to 0.5 mm are avialble, thickness range is grade and density dependent.	Tight tolerance with a smooth surface allows for very low resin consumption.	Thin, flexible sheets for the lightest weight requirements. Minimum and maximum thicknesses and available grades apply.
	T10		Skiving Tolerance	Specially slitted for tight thickness tolerance: ±0.1 mm. Thin sheets possible down to 0.5 mm are avialble, thickness range is grade and density dependent.	Tightest tolerance with a smooth surface allows for very low resin consumption.	Thin, flexible sheets for the lightest weight requirements. Minimum and maximum thicknesses and available grades apply.

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Diab is a world leader in sandwich composite solutions that make customers' products stronger, lighter and smarter. Diab provides a range of core materials, cost-effective kits and finishings, along with in-depth knowledge on composites. Diab also provides engineering services for composite technology through CCG (Composites Consulting Group). Diab is a participant in the UN Global Compact.

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