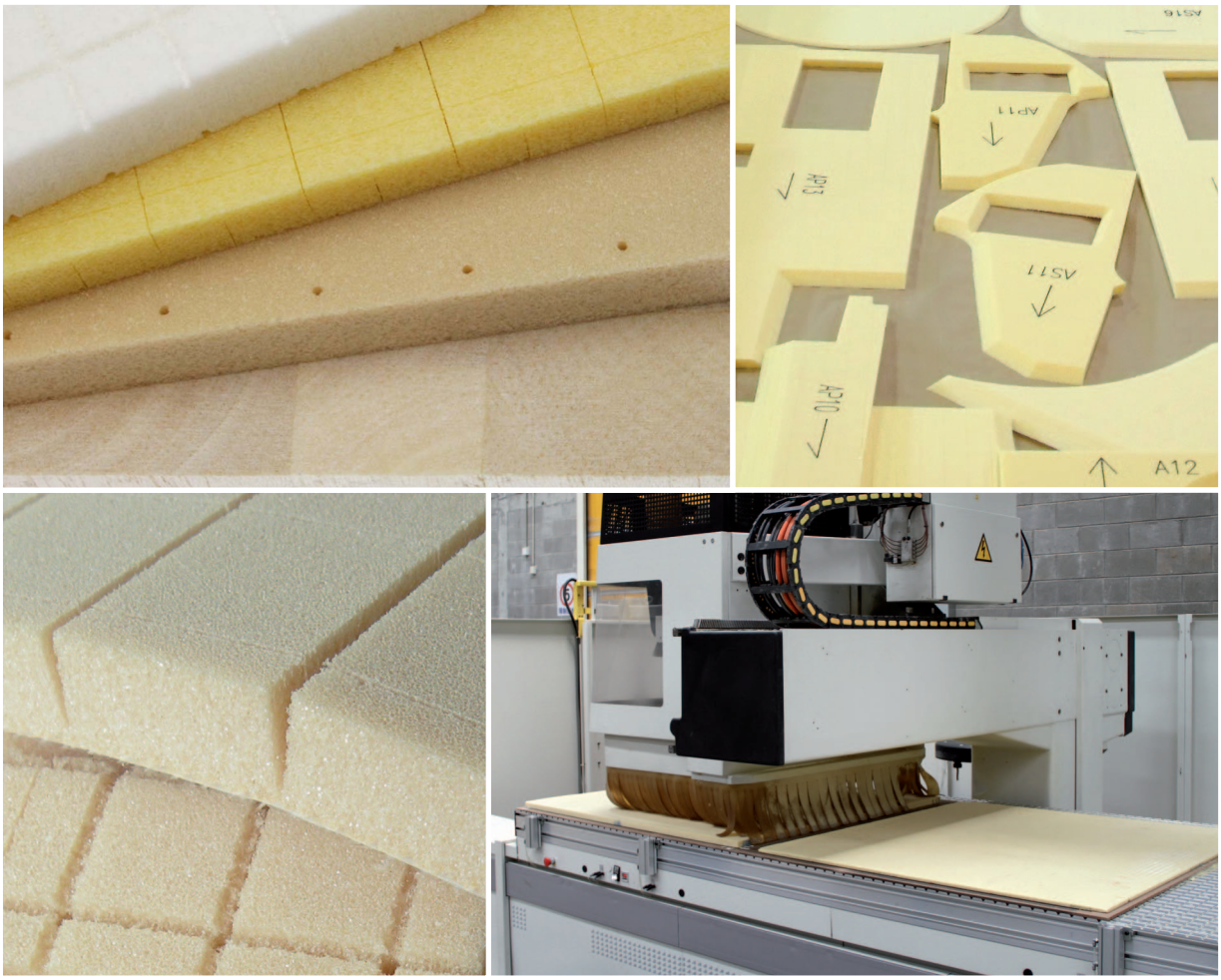

DELIVERING THE FUTURE OF COMPOSITE SOLUTIONS

CORE MATERIALS

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INTRODUCTION

Gurit is a technical leader in the development and manufacture of structural core materials. Cores in a sandwich construction are specified by designers and architects to increase stiffness and reduce the weight of a composite structure. Gurit has a range of core materials to fit any specification or manufacturing process. Structural core materials are offered in sheet form and with a variety of cut patterns or finishes, tailored to customer needs or processing choice.

G-PET™ THERMOPLASTIC CORE

G-PET™ is a highly adaptable, recyclable, thermoplastic core material with good balance of mechanical properties, temperature resistance, density and cost for a wide range of applications and processes.

PVCell™ G-Foam CROSS-LINKED PVC FOAM

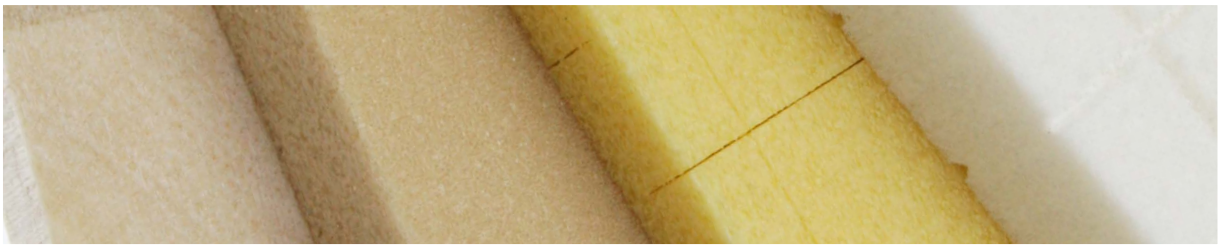
PVCell™ G-Foam is a closed cell, cross-linked PVC foam. It provides high strength to weight ratio for all composite applications. Other key features of PVCell™ include outstanding chemical resistance, low water absorption and excellent thermal insulation capabilities.

Balsaflex® END GRAIN BALSA WOOD CORE

Balsaflex® is the classic end-grain balsa wood core, featuring very high strength to weight ratio and is available in range of densities, thickness and format/finish. Balsaflex® is approved by Germanischer Lloyd (GL).

Corecell™ SAN STRUCTURAL FOAM

Corecell™ is a structural foam core material using a SAN polymer base featuring high toughness and impact resistant characteristics. Corecell™ has become widely accepted for the construction of large, high performance structures.



GURIT'S RANGE OF CORE MATERIALS

Essentials - Readily available recommended products

Specialist - Application specific products available on request

	TYPE	PRODUCT	DESCRIPTION	ATTRIBUTES	PAGE
ESSENTIALS	G-PET™ Thermoplastic Core	G-PET™	Recyclable structural foam core	¬ Recyclable ¬ Excellent mechanical properties ¬ Cost-effective ¬ GL approved	2
		G-PET™ LITE	Low resin uptake technology	¬ Optional finishing process for G-PET™ ¬ Resin uptake reduced at 0.6 – 0.8kg/m² ¬ Thickness from 15mm up to 150mm	
	PVCell™ Cross-linked PVC Foam	PVCell™ G-Foam	All-purpose foam	¬ Suitable for all sandwich applications ¬ Superior strength & stiffness:weight ¬ Outstanding chemical resistance ¬ GL, DNV, ABS and RINA approved	2
	Balsaflex® End Grain Balsa Wood Core	Balsaflex®	Classic wood core	¬ Available in typical densities & formats ¬ Very high mechanical properties ¬ Sustainably and responsibly sourced ¬ GL and Lloyds approved	3
		UVOTEC™	Low resin uptake technology	¬ Up to 1.3kg reduction in resin uptake	
	Corecell™ SAN Structural Foam	Corecell™ T-Foam	Industrial grade structural foam	¬ Superior strength & stiffness:weight ¬ Compatible with prepreg processing ¬ Cost-effective ¬ GL & Lloyds approved	4
		Corecell™ M-Foam	High performance foam, ideal for Marine applications	¬ High shear strength and low density ¬ Compatible with prepreg processing ¬ High elongation for toughness ¬ GL, DNV, RINA and ABS certified	4
SPECIALIST	Corecell™ SAN Structural Foam	Corecell™ A-Foam	Ultra tough foam suited for slamming applications	Please contact your local sales representative for further information on these products.	
		Corecell™ P-Foam	Heat stabilised ultra tough foam		
		Corecell™ S-Foam	Sub-sea buoyancy foam		
	G-PET™ Thermoplastic Core	G-PET™ FR	Recyclable fire retardant foam for civil applications		

G-PET™ and G-PET™ LITE

Recyclable Structural Foam

Recyclable | ABS & GL Certified | High Process Temperature

- Withstands high process temperatures
- Excellent chemical resistance
- Compatible with all types of composite manufacturing techniques
- Now benefits from 'LITE' surface treatment technology to reduce resin uptake
- Excellent adhesion & mechanical properties
- Recyclable

INTRODUCTION

G-PET™ is a highly adaptable, recyclable, thermoplastic foam with a good balance of mechanical properties, temperature resistance, density and cost for a wide range of applications and production processes. G-PET™ is GL approved.

G-PET™ can be processed at high temperatures, withstanding exotherms up to 150°C and offers outstanding fatigue properties, chemical resistance, good adhesion and is a highly consistent extruded foam. It is ideal for wind energy, marine, industrial and transportation applications.

G-PET™LITE is a surface treatment available for G-PET™ core thicknesses of 15 - 150mm. The treatment significantly reduces panel resin uptake by up to 0.6 - 0.8kg / sqm without reducing adhesion performance.

TYPICAL APPLICATIONS

G-PET™ is used extensively in wind turbine blades, civil and marine structures. G-PET™ is available in sheet, grooved/ perforated forms or kit-cut to customers' desired shapes.

PVCell™ G-Foam

All-Purpose Foam Core

High Chemical Resistance | GL, DNV, ABS & RINA approved | High Process Temperature

- Suitable for all composite sandwich applications
- Superior strength and stiffness to weight ratio
- Self extinguishing
- Outstanding chemical resistance
- Excellent thermal insulation capabilities

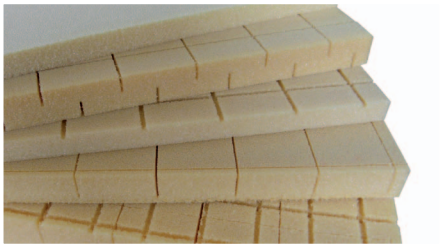
INTRODUCTION

PVCell™ G-Foam is a closed cell, cross-linked PVC foam widely used in wind energy turbine blades and marine composite structures. It provides high strength to weight ratio, outstanding chemical resistance, low water absorption and excellent thermal insulation.

PVCell™ G-Foam is compatible with most common resin systems including epoxy, polyester and vinylester. PVCell™ has various approvals including GL, DNV, ABS and RINA.

TYPICAL APPLICATIONS

PVCell™ G-Foam is an all purpose core and can be used in decks, hull sides, bulkheads, floors and wind turbine blade shells.



Balsaflex®

Classic Wood Core

Natural and Sustainable

GL certified

High strength to weight ratio

- High quality composite core material made from end grain balsa
- Highest strength to weight ratio of any structural core
- Natural, sustainable and responsibly sourced
- Now available with UVOTEC™ surface coating to reduce resin uptake

INTRODUCTION

Balsaflex® is the classic end-grain balsa wood core, featuring very high strength to weight ratio. When an application requires high-strength and stiffness and cost effectiveness, Balsaflex® is a suitable solution due to a good balance between cost, properties and weight. Balsaflex® is available in a range of densities, thicknesses, formats and finishes. Balsaflex® is GL and Lloyds approved.

TYPICAL APPLICATIONS

Balsaflex® is used for wind turbine blades and nacelles, marine, automotive, truck, rail and aircraft parts. Balsaflex® can be supplied in sheet form or kit-cut to customer's desired shapes.

balsaflex
END GRAIN BALSA

Balsaflex® UVOTEC™

Low resin uptake technology

Cost & weight reduction

EP, VE & PE compatible

New product innovation

NEW

- Up to 1.3kg reduction in resin uptake / sqm
- Balsaflex® 110 & 150 are GL and Lloyds Registry approved
- Potential to engineer weight / cost reduction out of sandwich laminate
- Suitable with all balsa composite processes
- Suitable for existing components designed with the properties of Balsa
- Minimal loss in adhesion performance versus uncoated balsa

INTRODUCTION

Gurit has developed a next-generation of balsa core materials for the manufacture of ever lighter and lower-cost sandwich panels.

UVOTEC™ is based on a unique surface treatment that modifies the surface topography to significantly reduce the quantity of resin absorbed during an infusion without negatively compromising the skin adhesion properties.

The net effect is that the end-user saves 1-1.3kg of infusion resin per m^2 panel. This brings two main advantages; reduced weight of the finished component and a saving in infusion resin quantity, hence a reduction in cost.

TYPICAL APPLICATIONS

Balsaflex® is used for wind turbine blades and nacelles, marine, automotive, truck, rail and aircraft parts. Balsaflex® can be supplied in sheet form or kit-cut to customer's desired shapes.

balsaflex
END GRAIN BALSA

Corecell™ T-Foam

Structural Foam Core

High Chemical Resistance | GL, DNV, ABS & RINA approved | High Process Temperature

- Suitable for all PVC core applications
- Outstanding chemical resistance
- Ideal for resin infusion
- Excellent mechanical properties
- 120°C processing
- 'LITE' version coming soon

INTRODUCTION

Corecell™ T-Foam has been developed as a technological step-change from traditional PVC and Balsa structural core. Corecell™ T-Foam is an outstanding core material in every application where balsa or X-PVC is commonly used. High mechanical toughness and thermal stability give Corecell™ T-Foam excellent fatigue characteristics. This reliability makes Corecell™ T-Foam a natural replacement for cross-linked PVC or balsa in applications where a significant service life is required.

The high temperature stability of Corecell™ T-Foam also means that it can be used in manufacturing processes to at least 120°C / 250°F with short durations during a cure cycle to over 150°C / 300°F. This makes it ideal for use with conventional prepregs and in some liquid infusion processes where high resin exotherms can often be seen. Corecell™ T-Foam is available in every resin infusion format and is compatible with polyester, vinylester and epoxy resin systems. Low resin absorption characteristics of Corecell™ and unique knife cut formats allow for higher performing infusions, lower resin cost and lower weight than any other structural core.

TYPICAL APPLICATIONS

Ideal for applications where loads are less dynamic in nature, such as above the waterline on yachts, on wind turbines and in mass transport.

Corecell™ M-Foam

The Marine Foam

High Chemical Resistance | GL, DNV, ABS, BV, Lloyds & RINA approved | High Process Temperature

- Low resin absorption
- High temperature processing (prepreg compatible)
- High shear strength & elongation – ideal for areas subjected to slamming loads
- 'LITE' version coming soon
- Good compressive strength and stiffness
- GL, DNV, RINA, BV, Lloyds and ABS certification

INTRODUCTION

Corecell™ is a structural foam core material using a SAN polymer base featuring high toughness and impact resistant characteristics. It offers very reliable processing without outgassing for high quality parts. Corecell™ M-Foam is the newest addition to the Corecell™ range and shares the benefits of SAN chemistry common to all Corecell™ products.

TYPICAL APPLICATIONS

Corecell™ M-Foam has been developed to deliver one product for all Marine applications. It provides a combination of high shear strength with low density, high elongation, high temperature resistance and low resin uptake. M-Foam is the perfect choice whether your application is slamming area or superstructure, hull or deck, using hand lamination, infusion or prepreg.

FINISHING

Complete Core Solutions

INTRODUCTION

Gurit standard product forms are described below. Gurit can also tailor sheets to your own specification - please call to discuss your requirements.

CUTS FOR CONFORMABILITY (FOAM)

SC – Single Cut – Provides flexibility in a single direction on one or both sides of a sheet. If done on both sides, the cuts intersect so no bleeder holes are necessary for vacuum bagging. Max sheet size is half of a full-size sheet.

DC – Double Cut – Provides flexibility in two directions on one or both sides of the sheet. If Double Cut on both sides, the intersecting cuts make DC a highly effective resin infusion medium. The cuts are not visible when the sheets lie flat and these narrow knife-cuts minimise unnecessary resin accumulations compared to sawn core materials.

CS – Contour Scrim – provides optimum flexibility in two directions. Sheets are knife-cut in squares and bonded to a glass scrim. Available on sheets up to 25mm (0.98") thick. Maximum standard sheet size is half the full sheet.

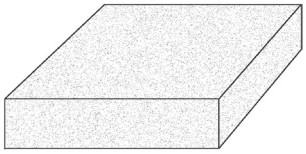
Surface grooves for infusion – Available on all foam types.

VIC – Vacuum Infusion Core – There are several VIC options and Gurit can customise grooving patterns and bleeder holes as required. For curved laminate sections, double-sided DC is very effective system for resin infusion with low weight gain. Heat forming VIC surface cut also useful for obtaining curved panels with minimal resin uptake.

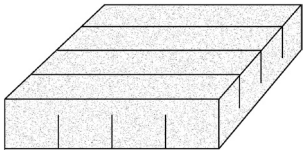
Combination – Combinations of these aforementioned formats are also available.

PRODUCT FORMATS (BALSA)

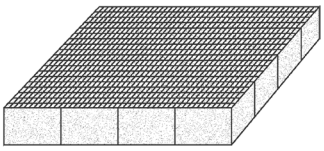
Balsaflex® is available plain or with typical formats including perforations, microgrooves, with or without scrim, contour scrim and with optional coating.



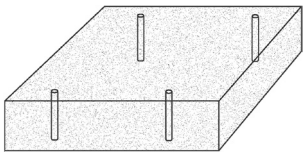
PL - Plain



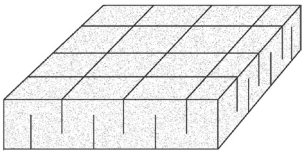
SC - Single Cut



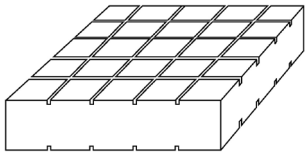
CS - Contour/Scrim



PH - Plain/Bleeder Holes



DC - Double Cut



VIC - Typical VIC

KITTING

Complete Core Solutions

INTRODUCTION

Gurit has an extensive kitting capability to provide all the Corecell™ formats in customised, numbered, ready to use, CNC machined kits. Gurit can make comprehensive kits using either full customer drawings or their B^3 SmartPac software solution. All types of core can be supplied and machined including Corecell™ (SAN), PVCell™, G-PET™ and Balsaflex®.

Gurit use either 5-Axis, or 3-Axis CNC machines along with a range of semi-automatic and manual machines to provide the optimum kitting solution depending upon kit complexity. Gurit has developed specific knowledge and experience on the correct flute and clearance angles to provide optimum cutting conditions. This allows for quick cutting to minimise cost, accurate cutting for component dimensions and fine cutting to allow the best nesting routines so maximising yield rates and minimising waste.

Gurit's machining strategy for core is to develop a range of cutting techniques that provide a cost-effective and flexible kitting solution to satisfy customer requirements.

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Core Bro-6-0313