PRELIMINARY PRODUCT INFORMATION

Product Description

BPS240 is a two-ply partially-impregnated epoxy prepreg system designed for the manufacture of Body-In-White (BIW) panels with excellent surface-quality from vacuum-bag processing or compression-moulding at cure temperatures between 85°C - 180°C.

The first ply, utilising ACG's ZPREG partial impregnation technology, consists of a structural fabric coupled to a surface scrim by a high performance resin system. The second ply combines low-density syntactic core material and structural fabric to create significant panel rigidity in a rapid laminating format.

The system is designed to be ready for painting without abrading or reworking – in many instances paint can be applied directly to a degreased panel. Excellent environmental performance can be expected from panels painted in Hi-Bake & Lo-Bake paint systems.

Features

- Robust material format for consistent tack, excellent drape & conformation.
- Material architecture deisgned for reliable air-removal and excellent panel flatness & rigidity.
- High performance resin systems designed for service temperatures of up to 160°C.
- Excellent physical and environmental performance in painted automotive applications.
- Available, as standard, in carbon-fibre and glass-fibre variants, either in rolls or in pre-cut kits.
- Recommended for use with high-quality composite or metallic tooling.
- Flame Retardant – self-extinguishing when tested to ISO3795/FMVS302.

Standard Formats

System	Surface Ply Backing Ply	Approx Cured Thickness	Approx Areal Weight
BPS240 Carbon	VTF242FRB/GF1200/CF1100 VTS243FR/CF3500-0.75mm	1.5mm	1.9 kg/m^2
BPS240 Glass	VTF242FRB/GF1200/GF1100 VTS243FR/GF1100-1.0mm	1.6mm	2.1 kg/m^2

Advanced Composites Group Ltd
Composites House, Sinclair Close
Heanor Gate Industrial Estate
Heanor, Derbys, DE75 7SP
Telephone: 01773 766200
Fax: 01773 530245
E-Mail: info@acg.co.uk
Internet: www.acg.co.uk

CERTIFICATE No. 924425

PDS1185/09.06/1

Registered Office
Registered No. 2264869 England

Cured BPS240 Properties

Physical

	BPS240 Carbon	BPS240 Glass
CTE (30 – 100°C)	4.2 x 10^{-6} K^{-1}	17.1 x 10^{-6} K^{-1}
Tg (onset) (DMA 5% Modulus Loss)	118°C (120°C cure) 163°C (+ 180°C-postcure)	
Shrinkage-on-Cure (120°C-cure)	0.067% (120°C-cure) 0.088% (+ 180°C-postcure)	0.256% (120°C-cure) 0.275% (+180°C- postcure)
Relative Permittivity	*To be determined*	*To be determined*
Cured Resin Density	VTF242FRB = 1.230 gms/cc VTS243FR = 0.950 gms/cc	

Tests carried out samples of complete system, i.e. 2-ply laminates. CTE & Shrinkage measurements taken from samples tested in 0° fabric direction (i.e. along fabric warp).

Weightsaving Potential

		BPS240 Carbon	BPS240 Glass
Weight-saving compared to panels of...	0.7mm Steel[1]	65%	62%
	1.1mm Aluminium[1]	36%	29%
	3.0mm SMC[2]	67%	63%
	2.5mm Thermoplastic[3]	42%	35%

[1] Typical metallic panel thickness
[2] Typical 'Class-A' glassfibre SMC variant. Panel thickness is at, or near, minimum feasible.
[3] Typical exterior panel variant. Panel thickness is at, or near, minimum feasible.

Mechanical

	BPS240 Carbon	BPS240 Glass
Tensile Modulus	38.0 GPa	13.9 GPa
Tensile Strength	292.5 MPa	162.0 MPa
Compressive Modulus	37.0 GPa	15.5 GPa
Compressive Strength	370.7 MPa	356.3 MPa
Tensile Poisson's Ratio	0.06	0.19
Compressive Poisson's Ratio	0.06	0.19
In-Plane Shear Modulus	2.90 GPa	2.52 GPa
In-Plane Shear Strength	55.5 MPa	52.7 MPa
Flexural Modulus	34.1 GPa	16.0 GPa
Flexural Strength	598 MPa	403 MPa

All results from tests in 0° fabric direction (i.e. along fabric warp). Samples were cured for 1hr @ 120°C.

It should be noted that the results given in the table above are results for the specific 'systems' described earlier and hence for a specific thickness. Accordingly, the stress & modulus values cannot be directly applied in models of components at non-standard thickness. Please contact ACG for further advice & support in these cases.

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Storage

BPS240 material rolls should be supported through the cardboard core or by standing on end. If left unsupported on a surface the rolls will eventually self-impregnate with possible detriment to handling and cured surface finish.

When not in use, BPS240 materials should ideally be stored in a freezer or refridgerator. The following shelf-lives can be expected:

	Storage Temperature	
	-18°C	21°C
VTF242FRB Surface Ply	>12 mths	7 days
VTS243FR Backing Ply	>12 mths	30 days

When the materials are removed from the freezer it is essential that all of the material is allowed to thaw and reach room temperature BEFORE the polyethene bag is opened. For example, the thaw time for a 20Lm roll taken from –18°C storage into a 21°C room is typically between 4-6hrs.

Unless the material is allowed to fully thaw, condensation may form on the surface – moisture within a curing laminate may be extremely detrimental to final part quality and appearance. When materials are returned to the freezer they MUST be resealed to prevent ingress of moisture.

Availability

Rolls

The surface and backing materials will be supplied on separate rolls, usually ~25lm in length. For automated processing alternative roll lengths may be available upon request. Each roll will be supplied in a cardboard box, or rolls may be grouped into larger stillages upon request.

Pre-cut Kits

ACG is pleased to offer a nesting and kit-cutting service for the BPS240 materials. The exact packaging details can be determined to suit each customer's needs.

By receiving pre-cut kits, the customer reduces waste handling requirements and can expect the maximum ease of handling. Engineering support is available to optimise kit templates for best material utilisation and component quality & consistency.

Tooling Systems

BPS240 materials are intended for moulding in high quality composite or metallic tooling that will impart net-shape and excellent finish to the component. Abrasion or reworking of the cured component surface may be detrimental to the aesthetic quality and longevity of that surface once painted and is NOT recommended.

ACG has developed a considerable knowledge base regarding the application of composite body panel solutions. Additionally, the company can offer a range of composite tooling solutions intended for high surface-quality applications and will be pleased to offer further advice and support upon request.

Health and Safety

Although ZPREG technology offers improved health & safety characteristics over traditonal prepreg systems, the BPS240 system contains epoxy resins that can cause allergic reactions by skin contact. Avoid prolonged or repeated skin contact – the use of gloves and protective clothing is advised.

Where contact occurs, clean the skin thoroughly using soap & water or proprietary resin-removers. DO NOT USE SOLVENTS FOR SKIN-CLEANSING.

In the un-cured state, ZPREG materials contain dry fibres. Small amounts of these fibres may be released during cutting & handling of the materials. Skin contact with these fibres should be minimised, as should dispersal of the fibres into the workplace. Particular care should be taken using carbon fibre materials around electrical products – such equipment should be made intrinsically safe.

Mechanical exhaust ventilation should be employed when heat-curing the materials – particularly of the vacuum pump exhaust.

For further information please consult ACG Material Safety Data Sheets:

MSDS415	VTF242FRB
MSDS428	VTS243FR

ATTENTION:

The success and longevity of any body panel material is dependant upon many factors including component design, tooling quality, moulding process, painting process and lifetime environmental conditions. It is the responsibility of the user to demonstrate the fitness for purpose of BPS240 materials for their intended applications and processes.

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