euromere NEWS
COMPOSITES by passion!
ISSUE 16 | 01 2022

LATEST EVOLUTIONS ON BARRIER COAT TECHNOLOGIES AT EUROMERE

BY LAURENT IMBERT

FSP®-BC Barrier Coat

BACKGROUND

The markets where long term resistance, cosmetics and productivity are important factors have pushed processors and formulation companies of specialty materials such as EUROMERE to develop reliable, rapid solutions that meet current environmental, health and safety criteria.

Boating, Transport, but also Construction sectors with the production of Swimming pools and Spas have enabled the use of Barrier Coat to be deployed as a replacement for more traditional methods consisting of applying a laminated layer (Skin Coat) with a performance resin.

This is actually even more than a trend as Skin Coat layers based on Vinylester Resins and/or isoNPG grades together with powder bounded glass mat have seen their prices and availability becoming a real issue around the world.

Barrier Coat improves the quality and durability of high-stress composites and reduces production times and costs.

BARRIER COAT TECHNOLOGY

Barrier Coat is a non-reinforced protective layer, to be sprayed directly behind the gel coat with a conventional two-component spraying machine.

Barrier Coat technology improves the osmosis resistance of the composite by providing water proof properties to the surface and reducing the glass fibers print through on the gel coat surface.

After application, gel coat surface that will stay fresh and sticky for hours will be protected from the outside elements faster than during the direct lamination of a skin coat. Its polymerization will be also less disturbed by air humidity, pollution and other dust.

The use of Barrier Coat also reduces the risk of crocodile skin effect, and all defects that can occur with micro porosity in a laminated skin layer.

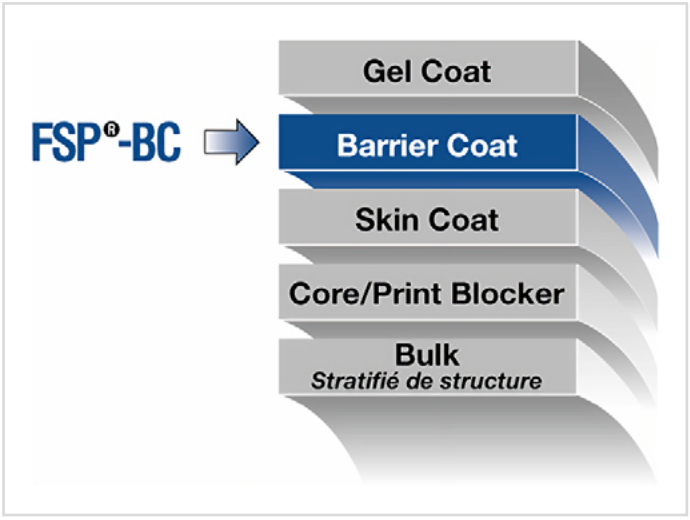


Figure 1

The use of Barrier Coat in production process gives the advantage of automation as robot spraying is possible where it is not with method that is more conventional *(see above figure 1)*.

BARRIER PRODUCT RANGE

BARRIER COAT RANGE	Base Tech.	Viscosity (P)	Thix index	Gel Time (min) 130 g 2% MEKP 50 20 °C	Density	Color	Application thickness (µm)
FSP-BC 1701	Hybrid	85 – 100	>5	10 – 20	0,75 – 0,85	Blue / Creme	400 – 500
FSP-BC 1701T	Hybrid	185 – 220	>5	10 – 20	0,75 – 0,85	Blue / Creme	500 – 900
FSP-BC 1701W	Hybrid	85 – 100	>5	06 – 10	0,75 – 0,86	Blue / Creme	400 – 500
FSP-BC 1700T	100% VE	160 – 200	>5	15 – 25	0,75 – 0,85	Green / Grey	500 – 900
FSP-BC 1102	Hybrid	90 – 120	>5	10 – 15	1,15 – 1,25	Blue / Creme	400 – 600
FSP-BC 1802	100% VE	100 – 170	>5	15 – 20	1,15 – 1,25	Green / Grey	400 – 600
FSP-BC 1803	100% VE	100 – 170	>5	10 – 15	1,15 – 1,25	Green / Grey	400 – 600

Euromere Barrier Coat range is wide and cover a large number of potential uses, depending on the end product requirements and application possibilities.

BARRIER COAT RANGE	APPLICATION			WHERE TO USE			
	Pot gun	Airless machine	Robot spray	Boat deck	Boat hull	Pools & spas	Molds
FSP-BC 1701	X	X	X	X	(X)	X	
FSP-BC 1701T		X		X	X	X	
FSP-BC 1701W	X	X	X	X	(X)	X	
FSP-BC 1700T		X			X	X	X
FSP-BC 1102	X	X	X	X	X	X	
FSP-BC 1802	X	X	X		X	X	X
FSP-BC 1803	X	X	X		X	X	X

MECHANICAL PROPERTIES

	SAMPLE A	SAMPLE B	SAMPLE C
	• 600µ Gel coat • 1 M300 (iso resin) • 2 M450 (iso resin)	• 600µ Gel coat • 600µ FSP 1701 • Wet on dry • 1 M300 (iso resin) • 2 M450 (iso resin)	• 600µ Gel coat • 600µ FSP 1700 • Wet on dry • 1 M300 (iso resin) • 2 M450 (iso resin)
Modulus (MPa)			
Before ageing	5 994	4 385	4 584
Water bath after 1000 h at 60 °C	4 792	3 375	3 326
Stress (MPa)			
Before ageing	141	145,6	143,5
Water bath after 1000 h at 60 °C	145	127	117
Elongation (mm)			
Before ageing	10,195	13,58	14,751
Water bath after 1000 h at 60 °C	8,84	10,536	9,552

The use of a barrier layer will tend to make the composite less rigid in flexural tests despite a greater thickness.
The flexural rupture values are therefore higher, in particular in elongation, before and after accelerated ageing.

The composite produced with Barrier Coat retains very good mechanical properties.

Exhaustive shock charpy testing with and without Barrier Coat behind gel coat have been done on both sides of the laminates.

Results are showing that the use of a Barrier Coat is not influencing the ball shocks and cracks are observed at >30 cm ball (1kg) drops.

Adhesive testing have also been repeated using cross hatched tests and Euromere Barrier Coat are showing very strong adhesion on gel coat surface, as well as laminated on the Barrier Coat. There is no issue of compatibilities and the final laminate produced is very compact and homogenous with very strong chemical and mechanical links in between layers.

APPLICATION

PISCINES IBIZA – Robot spraying of Barrier Coat

The Barrier Coat was developed first to make robotic applications possible. But definitely standard spraying with gel coat machine is a lot developed in all markets.

The use of Barrier Coat in machine spraying has become widespread with and without a robot.
The machine must have characteristics quite similar to that used in the spraying of Gel Coat. Just add a feeder pump, and an adapted nozzle to allow the spraying.

The Barrier Coat is blue or green, and after catalysis, will turn beige or grey to visualize the presence and the correct mixture of the MEKP.

Spraying is generally done on a gel coat that has just gelled, even if the risk of crocodile skin is very limited, the Barrier Coat containing only very little styrene.
The rapid film setting allows the gel coat to be protected immediately and covered more quickly.

The cycle gains are significant.

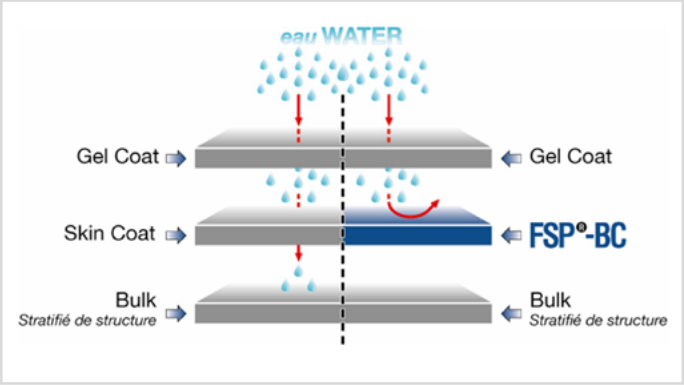
OSMOSIS PROTECTION

Where Euromere Barrier Coat technologies have pushed the limits far ahead is when looking at performances! The Barriers are acting as real protection again water penetration and ageing in a long run.

The Barrier is acting like a waterproof membrane, protecting water penetration in the bulk laminate, and osmosis reaction.

The Barrier Coat is composed exclusively of high-performance materials that have been selected for their resistance to water uptake, their level of physicochemical performance, and their compatibility. This coating applied behind the gel coat will permeabilize the total structure and delay osmosis considerably.

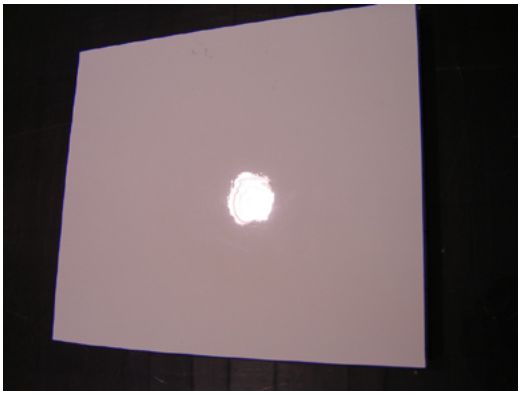
The result is a very high protection against the osmotic risk by a simple spray behind gel coat.



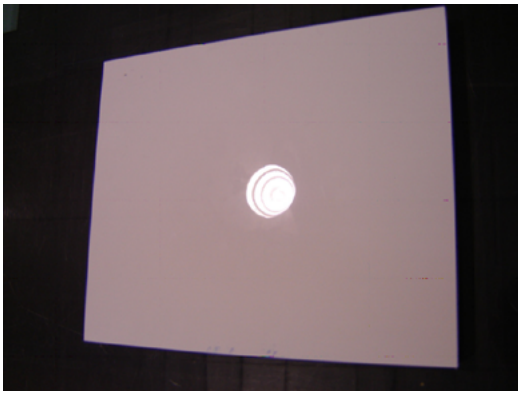
FIBER PRINT THROUGH PROTECTION

The surface print through caused by the fiber in direct contact with the gel coat is often unacceptable at the cosmetic level. The volume shrinkage of contact resins behind gel coat often forces processors to use less reactive resins, or to reduce thicknesses to limit surface marking.

The use of Barrier Coat easily reduces surface marking, including eliminating the use of hard laminates before injection or infusion.



Infused sandwich panel WITHOUT Barrier Coat



Infused sandwich panel WITH Barrier Coat