SCOTT BADER

WE THINK
INNOVATION

Crystic® Gelcoat Range

Innovative high performance gelcoats for a wide range of product applications

GEL TINT

Rapid Colour

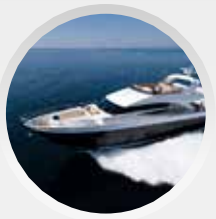
CONTENTS

OUR ADVANCED GELCOATS, YOUR EXACT COLOUR

GEL TINT

Rapid Colour

GelTint is one of the latest innovations from Scott Bader and means that all of our advanced, high quality gelcoats can now be supplied in ANY colour. The GelTint service offers the latest in pigment and gelcoat technology, combined with advanced dispersion equipment guaranteeing the renowned Scott Bader quality for ease of use, finish and longevity, already associated with its gelcoats.



FAST

GelTint colour matching service is fast, typically taking 24 hours from order.

PRECISE

RAL colour codes are matched and reproduced with extremely high accuracy.

RESILIENT

Brilliant long-term colour and gloss retention as well as strong durability.

GelTint is the modern way to order and use Scott Bader's gelcoats. Try something new...

Visit **www.GelTint.com** or call our Technical Support Team on **+44 (0)1933 663100**

SCOTT BADER

CRYSTIC®

Gelcoats at a Glance

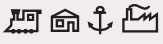
ISO BRUSH GELCOATS	DESCRIPTION	APPLICATION
65PA	General purpose gelcoat with good water resistance	Marine – hulls, decks and components, building, transport or any general industrial application
64PA	Low viscosity brush gelcoat	Marine - hulls, decks and components, building, transport or any general industrial application
65E	Isophthalic gelcoat with excellent water and weather resistance	Marine and transport industries
LS 88PA	Low styrene content superior weathering gelcoat with excellent water resistance	Marine – hulls, decks and components or other building/transport or industrial applications requiring excellent colour stability and gloss retention when exposed to sunlight
33PA	Flexible gelcoat with good impact resistance	Marine – decks and components, building, transport or any general industrial application
80PA	Pre accelerated gelcoat designed for hand lay up	All general moulding and applications for brush yielding good coverage and flow levelling properties
69PA	Chemical resistant gelcoat	Sanitaryware applications - sinks, shower trays, baths, vanity units
ISO SPRAY GELCOATS		
ECOGEL S1PA	Market leading technology spray gelcoat with only 16% styrene content which may cut styrene emissions by over 50%	Building, Land Transport, Wind Energy, Industrial
LS 97PA	Low styrene content superior weathering gelcoat with excellent water resistance	Marine – hulls, decks and components or other applications requiring excellent colour stability and gloss retention when exposed to sunlight
LS 96PA	Low styrene content filled gelcoat with good handling properties	Building, transport or any general industrial application
0209SMK	Low styrene content, robust spray gelcoat with excellent handling properties	Building, transport or any general industrial application
81PA	General purpose spray gelcoat	All general moulding applications
90PA	Pre-accelerated gelcoat with excellent water and weather resistance	Industrial and general purpose

Brush	Airless	Gravity Gun	Viscosity (poise)	Geltime mins	Barcol Hardness	Water Absorption mg	HDT °C	Tensile Strength MPa	Tensile Modulus GPa	Elongation at Break %	Low Styrene Content	Approvals	Industry	Manufactured
■			Thix	9	42	18	75	75	3.5	3.0		Lloyd's		
■			Thix	8	44	17	65	61	3.1	2.7				
■			100	10 - 15	40	23	75	75	3.5	3		Lloyds		SBME
■			Thix	8	50	17	70	60	3.9	2.8	YES	Lloyd's		
■			Thix	10	33	26	55	66	3.3	4.9		Lloyd's		
■				20	40		75	65	3.5	2				SBME
■			Thix	9	49	16	96	57	3.8	1.6		Lloyd's		
	■		Thix	18	40	18	95	48	4.0	2.4	YES	Lloyd's		
	■		Thix	7	47	17	68	51	3.8	2.8	YES	Lloyd's		
	■		Thix	7	45	16	70	59	5.0	2.1	YES			
	■	■	Thix	9	35	18	75	68	4.1	2.8	YES			
				20	40		75	65	3.5	2				SBME
				8	40	18	73	66	3.4	2.5				SBPty

ISO NPG BRUSH GELCOATS	DESCRIPTION	APPLICATION
PERMABRIGHT (B)	Unique brush gelcoat technology with exceptional colour stability and water resistance	Marine - hulls, decks and components or other applications requiring excellent colour stability and gloss retention when exposed to sunlight
LS 31PA	Superior Weathering Iso/NPG Brush Gelcoat	Marine - hulls, decks and components or other applications requiring excellent colour stability and gloss retention when exposed to sunlight
69PA	Chemical resistant gelcoat	Sanitaryware applications - sinks, shower trays, baths, vanity units
32PA	Chemical resistant gelcoat with very low porosity	Sanitaryware applications - sinks, shower trays, baths and general applications requiring low porosity
2208NPG	Chemical resistance gelcoat	Sanitaryware applications - sinks, shower trays, baths requiring good chemical resistance
ISO NPG SPRAY GELCOATS		
84PA	Isophthalic gelcoat with excellent water and weather resistance	Marine and transport industries
PERMABRIGHT (S)	Unique spray gelcoat technology with exceptional colour stability and water resistance	Marine - hulls, decks and components or other applications requiring excellent colour stability and gloss retention when exposed to sunlight
LS 30PA	Superior Weathering Iso/NPG Spray Gelcoat	Marine – hulls, decks and components or other applications requiring excellent colour stability and gloss retention when exposed to sunlight. Can also be used for shower trays
92PA	Water and chemical resistant spray gelcoat	Chemical process plant fabricators and sanitaryware applications - sinks, shower trays, baths
967SMK EXCEL	Chemical resistant gelcoat with exceptional thermal shock resistance	All sanitaryware applications - sinks, shower trays, baths and vanity units
ECOGEL MARINE S3PA	Market leading technology spray gelcoat with only 23% styrene content which may cut styrene emissions by over 50%	Marine – hulls, decks and components or other applications requiring excellent colour stability and gloss retention when exposed to sunlight
FIRE RETARDANT BRUSH GELCOATS		
73PA	Halogen free fire retardant brush gelcoat which meets BS476 part 7 class 2 with 2.3700PA	Applications requiring a fire retardant brush gelcoat
75PA Excel (B)	Unique, intumescent fire retardant coating which when applied to the reverse side of any laminate will meet M1 and BS476 part 7	Applications where parts may be accidentally exposed to direct flames which includes engine rooms in boats and under the bonnet in buses or other vehicles
75PA (IMB) Excel	Intumescent fire retardant gelcoat for brush application	Marine, building and transport industries
FIRE RETARDANT SPRAY GELCOATS		
70PA	Halogen free fire retardant spray gelcoat which meets EN45545 HL2 with Crestapol 1212	Applications requiring a fire retardant spray gelcoat
72PA	Halogen free fire retardant spray gelcoat which meets BS476 Part 7 class 1 with 1355PA and M1 with Crestapol 1212 and M2/F2 with Crystic 26026	Applications requiring a fire retardant spray gelcoat
76PA FR	Low smoke, Isophthalic fire retardant gelcoat	Building & Industrial
75PA Excel (S)	Unique, intumescent fire retardant coating which when applied to the reverse side of any laminate will meet M1 and BS476 part 7	Applications where parts may be accidentally exposed to direct flames which includes engine rooms in boats and under the bonnet in buses or other vehicles
75PA (IMS) Excel	Intumescent fire retardant gelcoat for spray application	Marine, building and transport industries
SANDABLE GELCOATS		
42PA	Sandable gelcoat for easy and precise abrasion	Transport market or any parts that need to be post-painted
43PA	Very low viscosity sandable gelcoat, extremely easy to sand	For complicated shapes that will be post-painted, eg mannequins
3.7020PA	Sandable spray gelcoat, for easy and precise abrasion	Transport market or any parts that need to be post-painted
44PA	Sandable spray gelcoat	Transport market

Brush	Airless	Gravity Gun	Viscosity (poise)	Geltime mins	Barcol Hardness	Water Absorption mg	HDT °C	Tensile Strength MPa	Tensile Modulus GPa	Elongation at Break %	Low Styrene Content	Approvals	Industry	Manufactured
■			Thix	8	46	9.4	53	58	3.4	3.3	YES	Lloyd's		
■			Thix	8	41	10	65	57	3.4	2.8	YES	Lloyd's		
■			Thix	9	49	16	96	57	3.8	1.6		Lloyd's		
■			Thix	10	46	17	83	64	3.8	2.0				
■			Thix	10	40	17	98	50	2.1	2.2				
	■		50	20	44	23	80	75	3.5	2.5		Lloyds		SBME
	■		Thix	8	48	6.3	68	61	3.8	2.7	YES	Lloyd's		
	■		Thix	9	46	10	62	52	3.4	2.8	YES	Lloyd's		
			Thix	6	47	16.4	94	54.5	3.7	1.6				
	■		Thix	9	45	-	90	70	3.4	3.0				
	■		Thix	11	40	-	56	68	3.1	4	YES	Lloyd's		
■			Thix	10	42	-	62	59	4.1	2.2		BS 476		
■			Thix	10	40	No mechanical data. Not applicable for this product						BS 476		
■			Thix	10	40	No mechanical data.						BS 476		
	■		Thix	12	46	-	77	56	4.7	2.6		EN 45545		
	■		Thix	12	47	-	68	64	4.2	2.0		BS 476		
	■		50	20	46	18	75	59	3.8	2.3				SBME
	■		Thix	10	40	No mechanical data.						BS 476		
	■		Thix	10	40	No mechanical data.								
■			Thix	10	37	20	54	46	3.7	2.1				
■			Thix	12	30	20	52	41	2.6	2.4				
	■		Thix	16	40	-	67	45	1.5	3.2				
			Thix	6	38	16	70	46	5.2	1.2				

TOOLING GELCOATS	DESCRIPTION	APPLICATION
11PA (S)	Iso/NPG tooling gelcoat with good heat and chemical resistance	General tooling applications
11PA (B)	Iso/NPG tooling gelcoat with good heat and chemical resistance	General tooling applications
12PA	Iso/NPG tooling gelcoat with good heat and chemical resistance	General tooling applications
14PA	Superior performance modified vinylester brush tooling gelcoat for making moulds designed to have a long service lifetime and retain high gloss levels after multiple pulls	All tooling applications particularly to eliminate problems of water marking
15PA (S)	Superior performance vinylester spray tooling gelcoat for making moulds designed to have a long service lifetime and retain high gloss levels after multiple pulls	All tooling applications
15PA (B)	Superior performance vinylester brush tooling gelcoat for making moulds designed to have a long service lifetime and retain high gloss levels after multiple pulls	All tooling applications particularly to eliminate problems of water marking
SPECIAL PURPOSE GELCOATS		
MOULDGUARD (B)	Unique, extremely flexible protection coating for moulds or final parts	For protecting moulds when they are not in use in production or for protecting parts in transit
MOULDGUARD (S)	Unique, extremely flexible protection coating for moulds or final parts	For protecting moulds when they are not in use in production or for protecting parts in transit
95PA	Clear chemical resistant gelcoat with excellent clarity for use with polystone chips to give granite / stone effects	Worktops or applications where a solid surface appearance is required which do not require a high level of thermal shock
997SMK	Water clear chemical resistant gelcoat. Can be used with polystone chips for a granite effect. Excellent thermal shock resistance	All Sanitaryware applications which require a clear resin for a marble or granite effect application
976SMK	Chemical resistant gelcoat	Swimming Pool applications
251PA	Very low styrene gelcoat for use with epoxy laminating and infusion systems	Marine - decks and components, or wind energy applications
252PA	Gelcoat for use with epoxy laminating and infusion systems	Marine – decks and components, or wind energy applications
253PA	Gelcoat for use with epoxy laminating and infusion systems	Marine - decks and components, or wind energy applications
255PA	Gelcoat for use with epoxy laminating and infusion systems where fire retardant properties are required	Marine - decks and components and building and construction applicatons
BARRIERCOATS		
CRESTACOAT 5000PA	The ultimate barriercoat for improving surface aesthetics based on unique chemistry. Applied behind a gelcoat it is especially good behind dark colours, in complex shapes and in infusion processes as good aesthetics	Marine – hulls, decks and components and any other application which requires good aesthetics e.g. moulds
BC 550PA	Polyester barriercoat for applying behind a gelcoat to reduce print through and achieve a superior surface finish	Marine – decks and components – and any other application which requires good aesthetics and will not be submerged in water for long periods of time
TOPCOATS		
47PA	Orthophthalic topcoat which cures tack-free	Applications requiring a smooth finish on the reverse side of a laminate
49PA EXCEL	Non-slip topcoat which cures tack-free	Applications requiring a non-slip finish on the reverse side of a laminate
65PAX	Isophthalic topcoat which cures tack-free	Applications requiring a smooth finish on the reverse side of a laminate and good long-term performance
LS97PAX	Isophthalic topcoat which cures tack-free	Applications requiring a smooth finish on the reverse side of a laminate and good long-term performance

Brush	Airless	Gravity Gun	Viscosity (poise)	Geltime mins	Barcol Hardness	Water Absorption mg	HDT °C	Tensile Strength MPa	Tensile Modulus GPa	Elongation at Break %	Low Styrene Content	Approvals	Industry	Manufactured
	■		Thix	10	40	-	98	50	2.1	2.2				
■	■		Thix	10	40	-	98	50	2.1	2.2				
■			Thix	9	46	17	83	64	3.8	2.0				
■			Thix	14	40	18	100	78	3.0	3.5				
	■		Thix	10	44	18	118	61	3.9	2.0				
■			Thix	10	45	18	106	78	3.9	2.7				
■			Thix	15	No mechanical data. Not applicable for this product									
	■		Thix	12	No mechanical data. Not applicable for this product									
	■		Thix	9	44	24	100	60	3.0	2.2				
	■		Thix	9	45	-	90	70	3.4	3.0				
	■		Thix	9	45	-	90	70	3.4	3.0				
■			Thix	10	44	17	68	66	4.0	2.1	YES			
■			Thix	9	51	18	71	65	4.3	2.2				
	■		Thix	10	42	18	76	67	3.9	2.2				
■			Thix	8	52	-	78	57	5.4	1.7				
■			Thix	25	70	-	58	17	1.1	3.5		Lloyd's		
■			Thix	9	49	13	59	47	4.6	1.5				
■			Thix	10	58	13	73	35	7.7	0.4				
■			Thix	10	No mechanical data. Not applicable for this product									
■			Thix	9	42	18	75	75	3.5	3.0				
	■		Thix	7	47	17	68	51	3.8	2.0	YES	Lloyd's		

Crystic® Superior Weathering Gelcoat Range

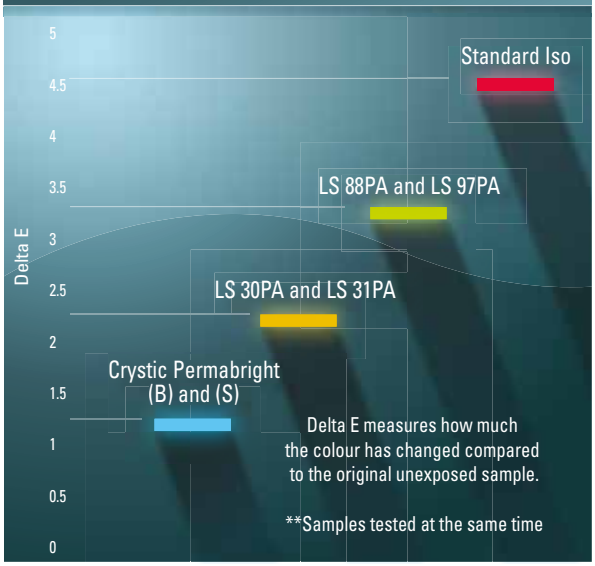
Scott Bader has led innovation in superior weathering gelcoat technology for over 50 years

Crystic Permabright - *2 times better colour stability than next best in class Iso/NPG* - 4 times better colour stability than a standard Isophthalic Gelcoat**

A dE of 1.0 is the smallest colour difference the human eye can see, so after 12 months in intense sunlight in Florida, the colour change of Crystic Permabright is difficult to detect.

This means, products manufactured using Crystic Permabright Gelcoat can maintain their show room look and condition for longer.

Colour change of White Gelcoats after 12 month Florida exposure (Delta E)**



Crystic Permabright (B)	D-Iso/NPG polyester brush gelcoat with outstanding weathering performance
Crystic Permabright (S)	D-Iso/NPG polyester spray gelcoat with outstanding weathering performance
Crystic LS 31PA	Thixotropic Iso/NPG brush gelcoat with good weathering performance
Crystic LS 30PA	Thixotropic Iso/NPG spray gelcoat with good weathering performance
Crystic LS 88PA	Thixotropic Isophthalic brush gelcoat with good weathering performance
Crystic LS 97PA	Thixotropic Isophthalic spray gelcoat with good weathering performance

Key benefits of the Crystic Superior Weathering Range:

- Market leading weathering performance
- Low styrene content
- Exceptional handling
- Low porosity finish
- D-Iso/NPG polymer technology of Crystic Permabright designed to combat colour change
- Low water absorption
- Easy to repair

Liquid Properties

Product	Description	Viscosity at 0.6 s^{-1}	Viscosity at 4500 s^{-1}	Specific Gravity at 25°C	Stability at 20°C	Geltime 25°C 2% Butanox M50 (or other equivalent catalyst)
Crystic Permabright (B)	D-Iso/NPG polyester brush gelcoat	350 - 450 poise	12 - 18 poise	1.2	3 months	6 - 10 minutes
Crystic Permabright (S)	D-Iso/NPG polyester spray gelcoat	230 - 280 poise	2.3 - 2.5 poise	1.2	3 months	6 - 10 minutes
Crystic LS 31PA	Iso/NPG brush gelcoat	350 - 450 poise	12 - 18 poise	1.1	3 months	6 - 10 minutes
Crystic LS 30PA	Iso/NPG spray gelcoat	230 -280 poise	2.3 - 2.5 poise	1.2	3 months	7 - 10 minutes
Crystic LS 88PA	Isophthalic brush gelcoat	400 - 470 poise	10 - 14 poise	1.2	3 months	7 - 12 minutes
Crystic LS 97PA	Isophthalic spray gelcoat	230 - 300 poise	2.3 - 2.5 poise	1.2	3 months	6 - 9 minutes

Mechanical Properties

Product	Description	Barcol Hardness	Heat Deflection Temperature	Water Absorption 24 hours at 23°C	Tensile Strength	Elongation at Break	Flexural Strength
Crystic Permabright (B)	D-Iso/NPG polyester brush gelcoat	46	53°C	9 mg	58 MPa	3.3%	103 MPa
Crystic Permabright (S)	D-Iso/NPG polyester spray gelcoat	48	68°C	6 mg	61 MPa	2.7%	97 MPa
Crystic LS 31PA	Iso/NPG brush gelcoat	41	65°C	10 mg	57 MPa	2.1%	106 MPa
Crystic LS 30PA	Iso/NPG spray gelcoat	46	62°C	10 mg	52 MPa	2.8%	88 MPa
Crystic LS 88PA	Isophthalic brush gelcoat	50	70°C	17 mg	60 MPa	2.3%	100 MPa
Crystic LS 97PA	Isophthalic spray gelcoat	36	63°C	17 mg	74 MPa	4.7%	89 MPa

Markets

- Marine
- Building
- Transport
- Industrial
- Applications where exterior durability is critical

Crystic® Permabright High Performance D-Iso/NPG Polyester Gelcoat

Advanced polymer technology gelcoat with exceptional colour stability, available for both brush and spray application.

Crystic Permabright - *2 times better colour stability than next best in class Iso/NPG* - 4 times better colour stability than a standard Isophthalic Gelcoat**

A dE of 1.0 is the smallest colour difference the human eye can see, so after 12 months in intense sunlight in Florida, the colour change of Crystic Permabright is difficult to detect.

This means, products manufactured using Crystic Permabright Gelcoat can maintain their show room look and condition for longer.

Crystic Permabright Technology

Polyester Gelcoats will change colour when exposed to UV and this process is accelerated in hotter climates such as Florida. White and off-white gelcoats will turn yellow which is not aesthetically pleasing. So, in 2006 Scott Bader initiated a strategic gelcoat development project at its global R&D facility located in its Wollaston manufacturing site in the UK. The business identified the need for a superior gelcoat that could withstand harmful UV environmental conditions while delivering **vastly improved gloss retention and colour stability results**. The project's goal was to design a new gelcoat that would meet these needs leading to a step change in market performance. To achieve this objective the Scott Bader team of chemists utilised more than 50 years of experience producing world class unsaturated polyester gelcoats to introduce a new D-Iso/NPG polymer base **specifically designed to combat colour change**. The excellent gloss retention and colour preservation results from QUV & Xenon testing and 12 months of Florida exposure proves Crystic Permabright is one of the most significant developments the composites industry has seen for many years.

Princess 78 Motor yacht

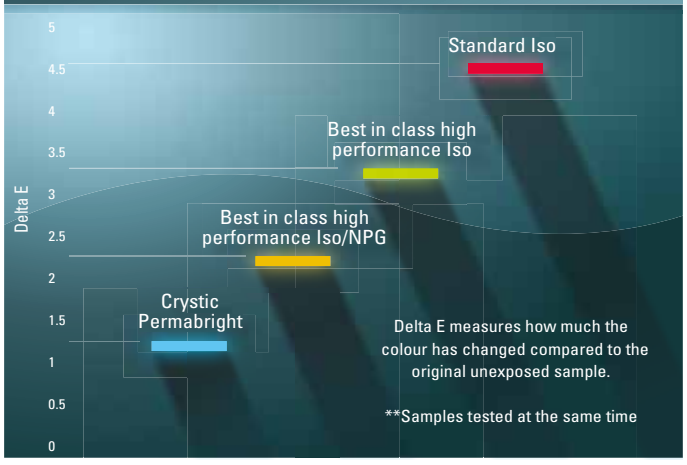
Markets

- ✔ MARINE
- ✔ BUILDING
- ✔ TRANSPORT
- ✔ INDUSTRIAL
- ✔ APPLICATIONS WHERE EXTERIOR DURABILITY IS CRITICAL

Technical Benefits of Crystic Permabright

- D-Iso/NPG polymer technology **designed to combat colour change**
- Excellent weathering performance measured by very low colour change and high gloss retention
- Can be used under the water line as the water uptake is very low and has high resistance to osmotic blistering when used as part of a marine grade system proven in a rigorous 12 month test
- Handling is comparable to an Iso/NPG based gelcoat with similar back up times
- The gelcoat base resin uses novel unsaturated polyester technology unique to Scott Bader
- Easy to repair
- Low porosity finish
- Low styrene content
- Available in white, off-white and light cream shades

Colour change of White Gelcoats after 12 month Florida exposure (Delta E)**



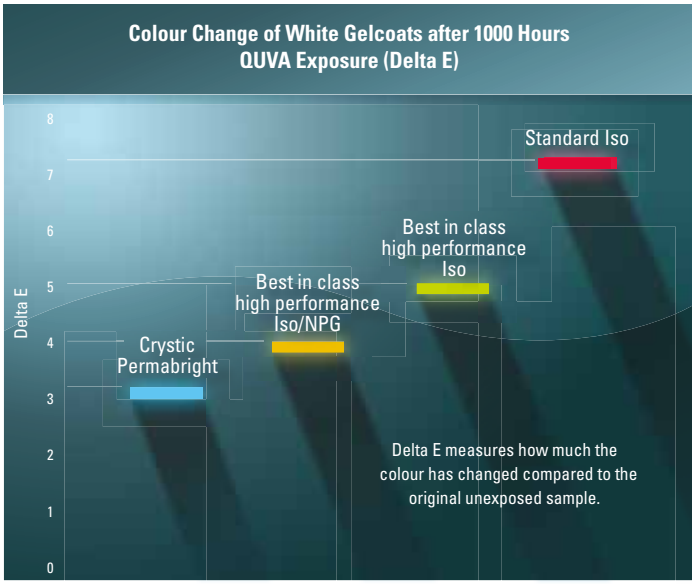
*Calculated using dE values from a 12 month Florida weathering test

Facts About Marine Gelcoats

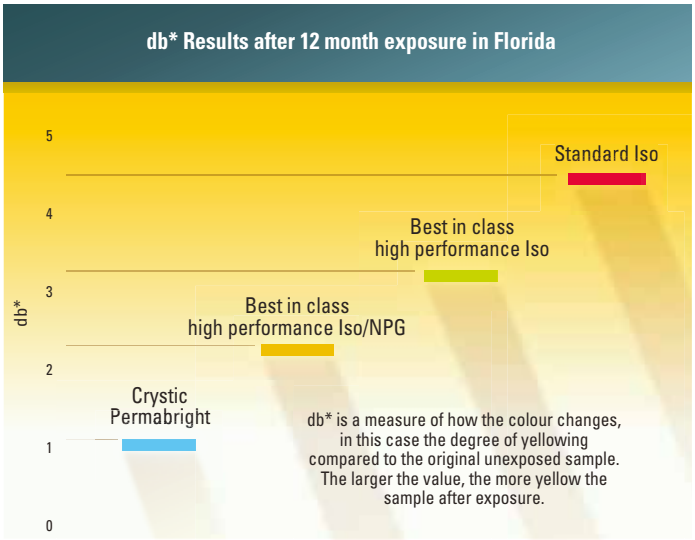
Gelcoats used for the marine industry have to be durable and resist the effects of sunlight and moisture. Sunlight and harmful ultraviolet (UV) radiation have a destructive effect on unsaturated polyester resins leading to loss of gloss and colour change. Moisture penetration into the gelcoat is just as harmful with blistering and delamination from the glass reinforced unsaturated polyester composite. Over the years incremental improvements to the UV resistance has been made but gelcoats currently on the market still exhibit noticeable colour change when exposed to sunlight. Crystic Permabright has been developed to show very little colour change over time and is indeed a step-change technology for the industry.

PANELS IN FLORIDA - Extreme natural exposure conditions accelerate product weathering, two to three times faster than normal locations.

Circular gelcoat panels used for 12 month blistering test in de-ionised water.



This is an accelerated weathering test which can be used as an indication of performance.



Properties	Typical Result Brush	Typical Result Spray
Viscosity, 25°C 0.6s^{-1}	350 – 450 poise	230 - 280 poise
Viscosity, 25°C 4500s^{-1}	12 – 18 poise	2.3 - 2.5 poise
Specific Gravity at 25°C	1.2	1.2
Stability at 20°C	3 months	3 months
Geltime 25°C 2% Butanox M50 (or other equivalent catalyst)	6 – 10 minutes	6 – 10 minutes

Mechanical Properties	Method	Typical Value Brush	Typical Value Spray
Barcol Hardness (Model 934-1)	EN 59	46	48
Heat Deflection Temperature	BS EN ISO 75-2 (1996)	53°C	68°C
Water Absorption 24 hours at 23°C	BS EN ISO 62 part 6.2	9.4 mg	6.3 mg
Tensile Strength	BS EN ISO 527- 2	58 MPa	61 MPa
Elongation at Break	BS EN ISO 527- 2	3.3 %	2.7 %
Flexural Strength	BS EN ISO 178	103 MPa	97 MPa
Flexural Modulus	BS EN ISO 178	2980 MPa	3490 MPa

Crystic® LS30PA Spray Gelcoat

Thixotropic Iso/NPG spray gelcoat with exceptional long-term performance to suit demanding external applications in marine, building, transport and industrial markets.
Use it with the knowledge that it comes with the proven quality guarantees associated with Scott Bader and has been particularly designed for use where exterior durability is critical.

Key Benefits

- **Excellent weathering performance - both accelerated weathering and 12-month Florida exposure reveal negligible colour change and excellent gloss retention.**
- **Exceptional handling – easy to spray**
- **Sag Resistant – sprayed films resist sagging and slumping**
- **Low porosity finish - achieved due to minimal air entrapment and good air release**
- **Lloyds approved**
- **Proven osmotic blistering resistance in a rigorous 12-month test.**
- **Low styrene content**

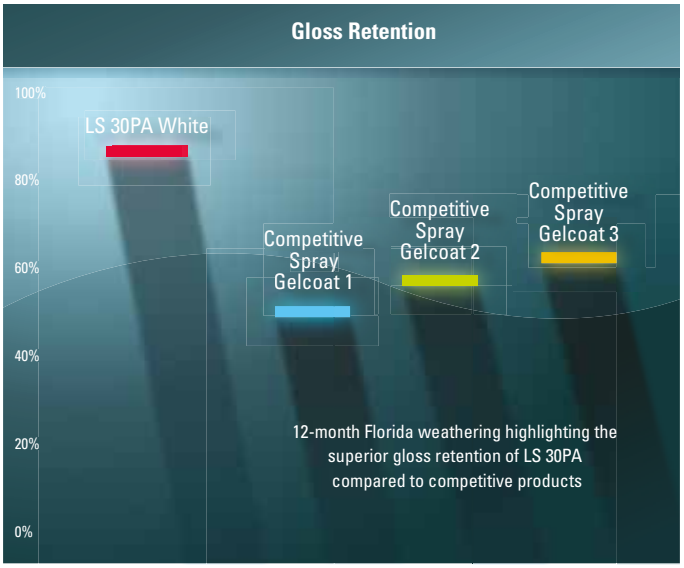
Markets

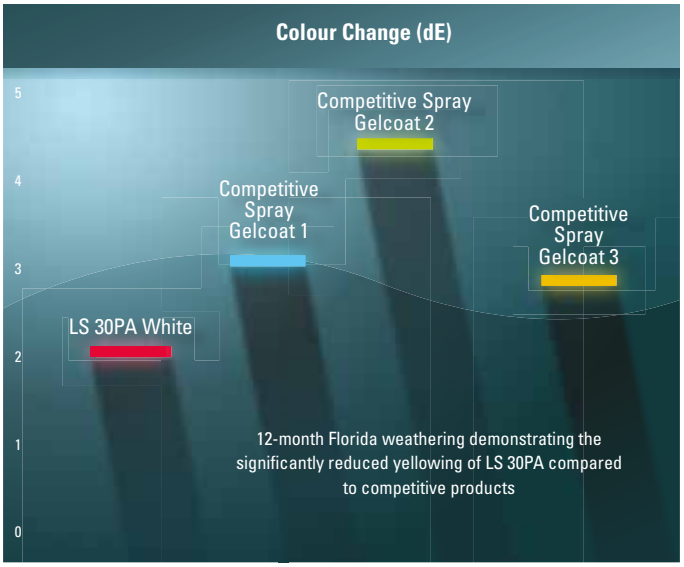
- Marine
- Land Transport
- Building
- Industrial
- Shower trays
- Applications where exterior durability is critical

Scott Bader's rigorous development programme ensures that all new gelcoats are tested under the most extreme conditions, including 12 months south facing exposure in Florida. Under these intense conditions, Crystic LS 30PA displays excellent weathering characteristics, making it an ideal choice for demanding exterior applications.

Specially designed test panels at the Atlas Weathering Services Group site in Florida, U.S.A.

Extreme natural exposure conditions accelerate product weathering, two to three times faster than normal locations.





Physical Data for Crystic LS 30PA in liquid state		
Property	**Unit**	**LS 30PA**
Viscosity @ 4500 s-1	poise	2.4
Viscosity @ 0.6 s-1	poise	250
Specific Gravity	-	1.2
Geltime (@ 25°C, 2% Butanox M50®)	minutes	5
Flash Point	°C	26

® Registered trademark of Akzo Nobel

Mechanical Data		
Property	**Unit**	**LS 30PA gelcoat**
Tensile Elongation	%	2.8
Tensile Strength	MPa	52
Flexural Modulus	MPa	3045
Barcol Hardness	-	47
Water Absorption, 4 weeks @ 23°C	mg	64.7
Heat Deflection Temperature (1.80 MPa)	°C	62

Pack Sizes: Available in 25kg kegs and 225kg drums

Crystic® Gelcoat LS31PA Iso-NPG Brush Gelcoat

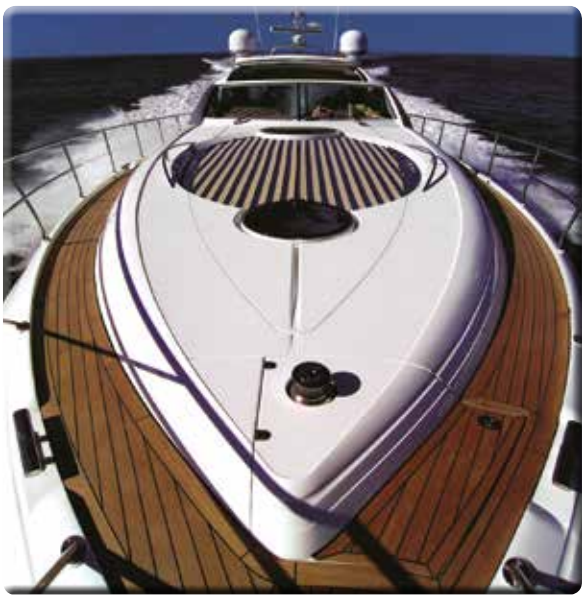
Scott Bader has spent a number of years in Research and Development to bring you a market leading Iso-NPG brush gelcoat for external applications where long-term durability is critical.

Technical Performance Benefits

- Superior Weathering Performance - both accelerated weathering and 12-month natural Florida exposure reveal neglible colour change and excellent gloss retention.
- Low Styrene Content
- Superior Handling - versus competitive Iso-NPG gelcoats
- Superb Water Resistance
- High Resistance to Osmotic Blistering - proven in a rigorous 12-month test when used as part of a marine grade system.
- Low Porosity Finish
- Lloyd's Approved
- Easy to Repair

MARKETS

- Marine
- Transport
- Building
- Industrial
- Applications where exterior durability is critical



Weathering

The main factors contributing to weathering are solar radiation, temperature and water (moisture). To fully measure degradation in different environments, Scott Bader implements a range of weathering tests that includes two forms of natural weathering and two forms of accelerated tests. However, the accelerated weathering results are used only to rank weathering ability and the 12 months natural Florida test is the ultimate indicator.

For natural Florida, Scott Bader uses the Atlas weathering group site in South Florida because of its subtropical climate. The test is carried out using open-backed panels that are 300mm long and 100mm wide. The panels are placed at 5^0 to the horizontal, in accordance with ASTM G7 "Recommended practice for atmospheric environmental exposures testing of non-metallic material".

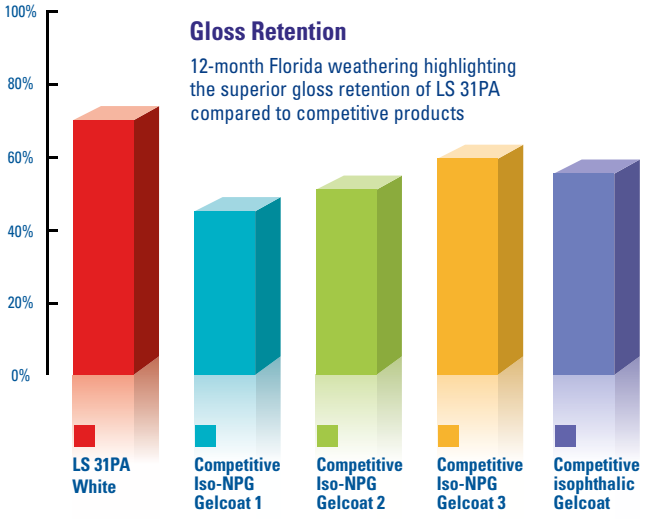
To ensure results are consistent, colour change from weathering is measured in-house using the CIElab colour model to measure any colour shift.

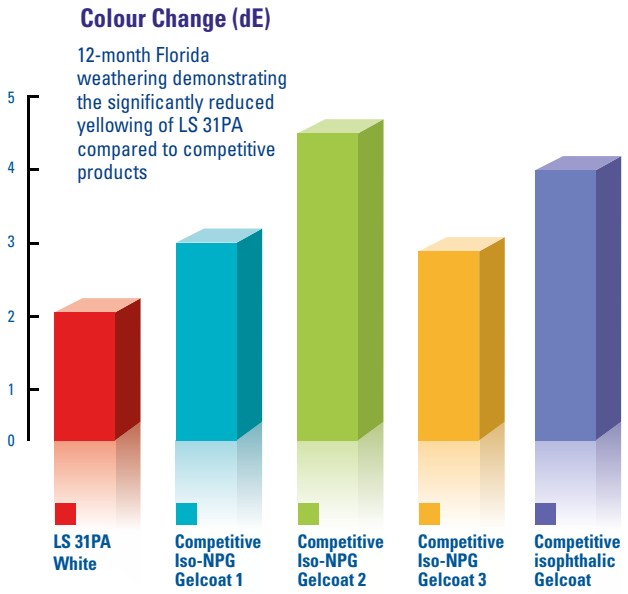
Specially designed test panels at the Atlas Weathering Services Group site in Florida, U.S.A.

Blistering

LS 31PA panels were subjected to water immersion at 40°C for 12 months and showed no sign of blistering and water pick-up was minimal. Scott Bader developed the test and has been using it reliably for over 30 years.

Weathering Results of LS 31PA





Liquid Properties

Property	Unit	LS 31PA
Viscosity @ 4500 s^{-1}	poise	15
Viscosity @ 0.6 s^{-1}	poise	400
Specific Gravity	-	1.1
Geltime @ 25 °C, 2%Catalyst M	minutes	8
Flash Point	°C	28

Mechanical Properties

Property	Unit	LS 31PA
Tensile Elongation	%	2.1
Tensile Strength	MPa	57
Flexural Modulus	MPa	3222
Barcol Hardness	-	41
Water Absorption, 4 weeks @ 23°C	mg	64
Heat Deflection Temperature (1.80 MPa)	°C	65

Crystic® LS88PA Brush Gelcoat

Low Styrene - Lloyds Approved - The Next Generation Marine Grade

Scott Bader has been setting performance benchmarks in marine gelcoats for over 50 years and we have done it again. Trusted by leading boat builders, Scott Bader has now developed Crystic® LS 88PA - the next generation brush marine gelcoat, to Crystic® GC 65PA.

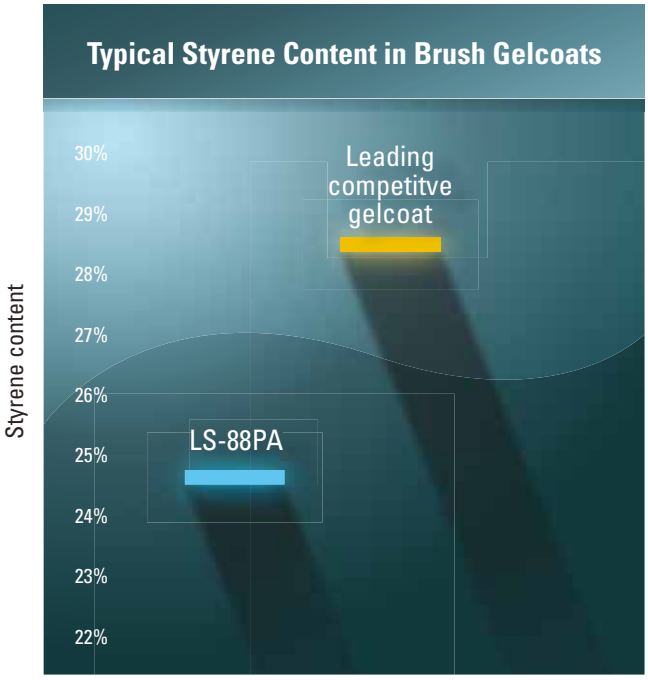
Crystic® LS-88PA retains all the benefits of Crystic® GC 65PA, such as excellent handling properties, proven osmotic blistering resistance and reliable product quality, but with two major improvements:

- **Significantly improved weathering performance**
- **A much lower styrene content - both in the product and while curing**

Crystic® LS-88PA offers moulders the following key benefits :

- **Excellent marine weathering performance**
- **Reduced styrene emissions in use**
- **Exceptional handling**
- **Lloyds Approval**

Our 'Gelcoat Development Team' has skilfully designed Crystic® LS-88PA to give outstanding performance, while still caring for the environment. All our gelcoats come with the proven, quality guarantees associated with Scott Bader, plus a technical support service you can rely on to help your business to be more successful.

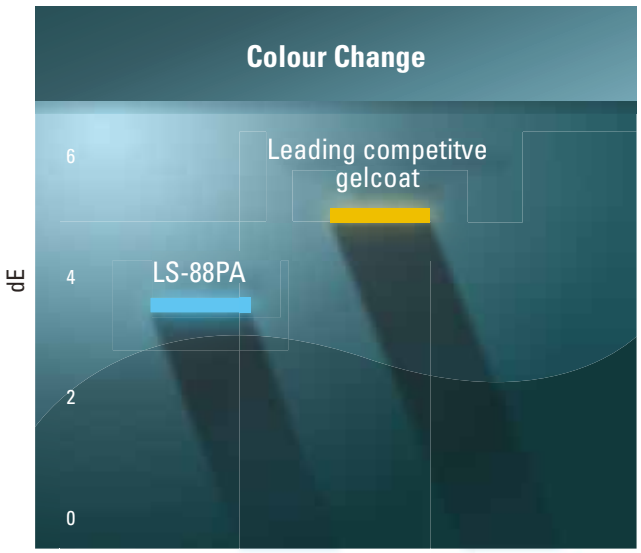


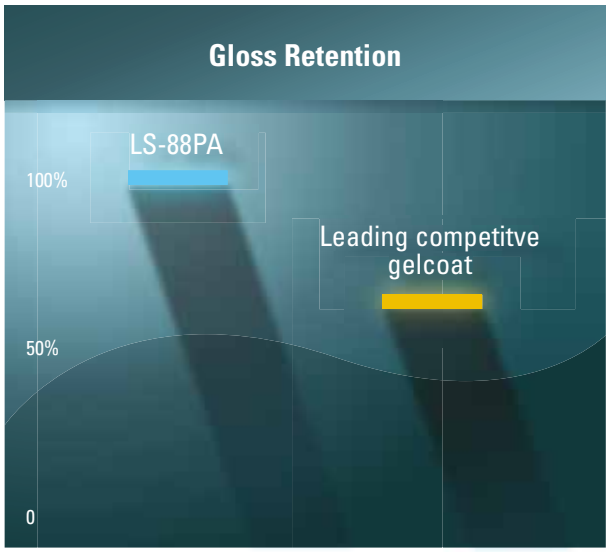
Specially designed test panels at the Atlas Weathering Services Group site in Florida, U.S.A.

Scott Bader's rigorous development programme ensures that all new gelcoats are tested under the most extreme conditions, including external weathering using EMMAQA® in the Arizona desert and 12 months continuous exposure in Florida.

Extreme natural exposure conditions accelerate product weathering, two to three times faster than normal locations.

Under these intense conditions, Crystic LS-88PA displays exceptional weathering characteristics, exhibiting 100% gloss retention and virtually no colour change at the end of the test period.





Mechanical data in cured state

Product	LS-88PA	Leading competitive gelcoat
Tensile Elongation	2.5	3
Tensile Strength	68	75
Tensile Modulus	4060	3500
Barcol Hardness	45	42
Water Abs 24hrs @ 23°C	17	18
HDT (1.80MPa)	76	75

Physical data for Crystic LS-88PA in liquid state

Product	LS-88PA
Viscosity @ 4500s-1	12
Viscosity @ 0.6s-1	440
Specific Gravity	1.26
Geltime 2%M @ 25°C	8

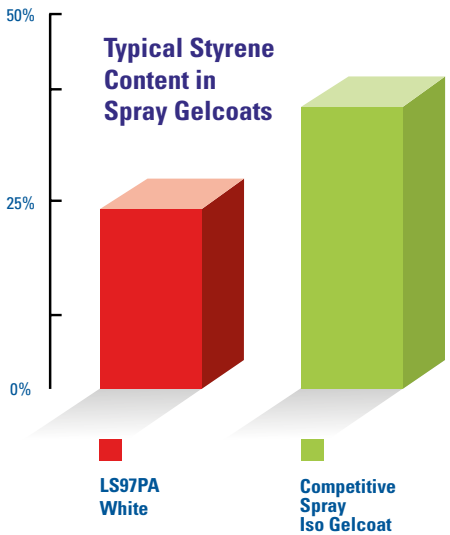
Crystic® LS97PA Spray Gelcoat

Scott Bader has developed an exceptional new thixotropic pre-accelerated isophthalic spray gelcoat in LS97PA. It has been designed to offer excellent performance in marine and other high performance gelcoat applications, offering superb handling properties and proven osmotic blistering resistance.

Crystic® LS97PA Key Benefits

- **Excellent weathering performance**
- **Low styrene content**
- **Exceptional handling**
- **Low porosity finish**
- **Lloyds Approval**

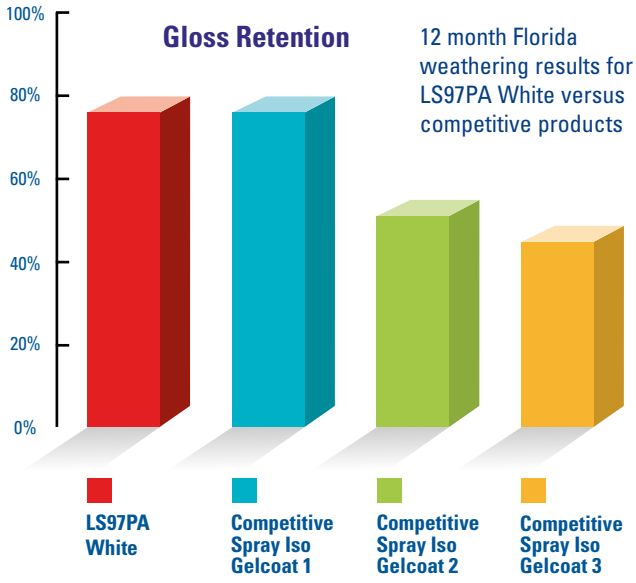
The Scott Bader gelcoat development team has skilfully designed Crystic LS97PA to give outstanding performance. Like all of our gelcoats, it comes with the proven quality guarantees associated with Scott Bader, plus a technical support service you can rely to help your business be successful.



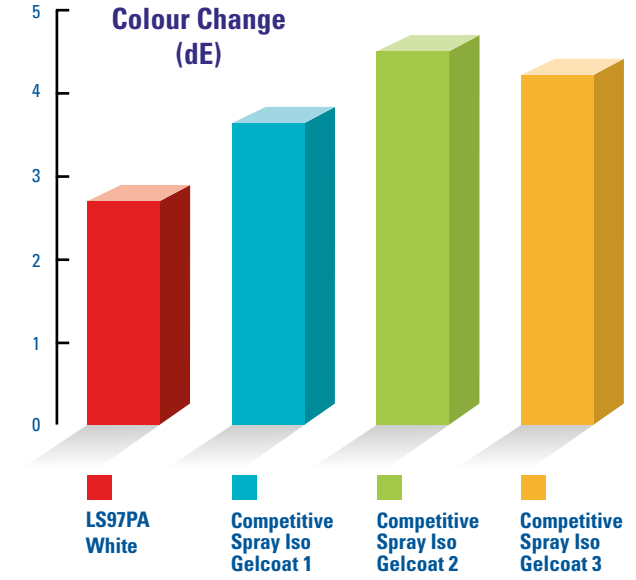
Scott Bader's rigorous development programme ensures that all new gelcoats are tested under the most extreme conditions, including 12 months south facing exposure in Florida. Under these intense conditions, Crystic LS97PA displays excellent weathering characteristics, making it an ideal choice for demanding exterior applications.

Specially designed test panels at the Atlas Weathering Services Group site in Florida, U.S.A.

Extreme natural exposure conditions accelerate product weathering, two to three times faster than normal locations.



12 month Florida weathering results for LS97PA White versus competitive products



Physical Data
for Crystic LS97PA in liquid state

Property	Unit	LS97PA
Viscosity @ 4500 s^{-1}	poise	2.5
Viscosity @ 0.6 s^{-1}	poise	270
Specific gravity	-	1.2
Geltime (@25 °C, 2 % Butanox M50®)	minutes	5
Flash Point	°C	26

® Registered trademark of Akzo Nobel

Mechanical Data
Typical values for Crystic LS97PA base resin*

Property	Unit	LS97PA base
Tensile elongation	%	4.7
Tensile strength	MPa	74
Flexural modulus	MPa	2800
Barcol hardness	-	36
Water absorption, 4 weeks @ 23 °C	mg	90
Heat Deflection Temperature (1.80 MPa)	°C	63

* postcured for 24 hours at 50 °C in accordance with BS EN ISO 12215-1 : 2000

Epoxy Bonding Polyester Gelcoats Designed to Bond to Epoxy Resin Systems

LDC Racing Sailboat manufactured by Synthesize Yachts and Design using Crystic GC 252PA

Customer Experiences

"We have been using Crystic GC 252PA for a number of years to manufacture racing sailboats as it is the only polyester gelcoat on the market that bonds to an epoxy resin. It's been used on many boats without any adhesion problems in tough conditions. We can de-mould very quickly so have cut down dramatically on processing time. It's much easier to apply than epoxy gelcoats and repairs can be done in a fraction of the time. We are very happy to recommend this product."

Jamie Stewart - Synthesize Yachts & Design

"Crystic GC 252PA is extensively used by Premier Composites with an epoxy resin system, as it is extremely compatible. The main application is for invalid ramps within the transport sector. It is Premier's preferred gelcoat because it is easy to apply, has rapid cure and is well suited to our production processes. We have been using it for over 5 years now, and are happy to have a reliable, cost effective product that does not suffer from batch to batch variation."

Richard Wild - Premier Composites

Crystic® Epoxy Bonding Gelcoats

A unique range of polyester gelcoats with exceptional adhesion to epoxy substrates allowing them to be used instead of an epoxy gelcoat. These gelcoats have been used successfully by moulders who find the product range offers excellent performance in demanding epoxy applications whilst retaining the ease of use of polyesters. This means customers enjoy huge savings on de-mould time and repairs over epoxy gelcoats, in addition to paying a lower unit price.

Markets

- Wind energy*
- Marine*
- Building*
- Industrial*
- Transport*

* Not for use in applications where parts are permanently immersed in water. Also not recommended for epoxy pre-pregs. For more information please contact the Scott Bader technical service department.

Product Range

		Viscosity (Poise)	Geltime* (mins)	Specific Gravity	Hardness (Barcol)	HDT (°C)+	Tensile Strength (MPa)	Tensile Modulus (GPa)	Elongation at Break (%)
Crystic GC 251PA	Designed for brush application, includes a styrene suppressant to give exceptionally low styrene emission in use	Thix	9	1.1	44	68	66	4.0	2.1
Crystic GC 252PA	Standard grade designed for brush application	Thix	9	1.1	51	71	65	4.3	2.2
Crystic GC 253PA	Standard grade designed for spray application	Thix	9	1.1	42	76	67	3.9	2.2
Crystic GC 255PA	Fire retardant brush gelcoat for use with epoxy laminating systems	Thix	8	1.4	52	78	57	5.4	1.7

Note 1: Cure schedule for mechanical data is 24 hours at 20°C, 3 hours at 80°C
Note 2: +Cure schedule for HDT is 24 hours at 20°C, 5 hours at 80°C, 3 hours at 120°C
Note 3: *Cure schedule for geltime is 2% Butanox® M50 at 25°C. Butanox is a registered trademark of Akzo Nobel.

Why Choose Crystic® Epoxy Bonding Polyester Gelcoats Instead of Epoxy Gelcoat?

Ease of Use and Time/Cost Savings

- No back surface preparation necessary to achieve exceptional adhesion.
- No tiecoat required.
- Polyester gelcoats can be backed-up rapidly meaning **de-mould times are significantly shorter** resulting in huge productivity gains.
- Polyester gelcoat **repairs are quicker and easier** saving considerable time and money.
- **Exceptionally easy handling** - simply add 2%MEKP catalyst and spray or brush apply.
- **Sag resistant** - at recommended thickness of 0.4mm - 0.8mm

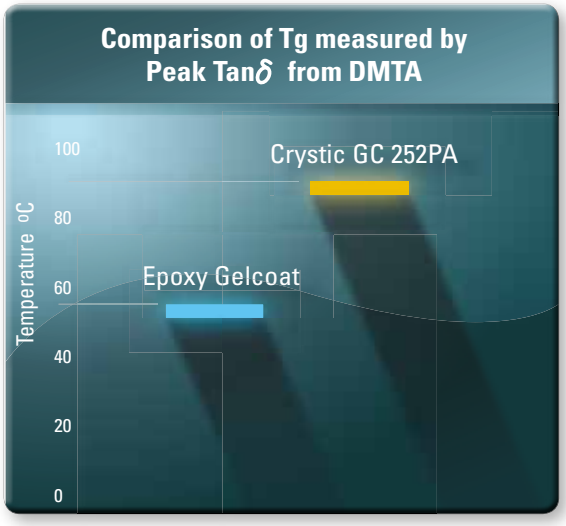
Unique Product Benefits

- **Significantly better UV resistance** - natural Florida 12-month weathering testing has shown excellent gloss retention and low colour change.
- **Cures at ambient temperature** - heated moulds not required, although cure at 30 - 35oC will reduce back up delay.
- **Supplied in any RAL or colour-matched colour.**
- **Optimum overcoating (back-up time) is 2 hours** - maximum is 24 hours.
- High Tg demonstrates ability to **withstand higher operating temperatures.**
- **Robust, reliable bond** - With both epoxy laminating and infusion systems and a number of wet lay epoxy systems. Not recommended for epoxy pre-pregs

Operating Performance

The higher Tg demonstrated by Crystic GC 252PA means it can withstand higher operating temperatures than the epoxy gelcoat.

Note 1: GC 252PA curing schedule of 16 hours at 40°C
Note 2: Epoxy Gelcoat curing schedule of 28 days at 21°C



Mechanical Performance

When Crystic Epoxy Bonding Gelcoats are used for the production of a typical laminate, the finished structure retains the excellent mechanical properties associated with epoxy systems. Values are similar across the Crystic Epoxy Bonding Gelcoat range.

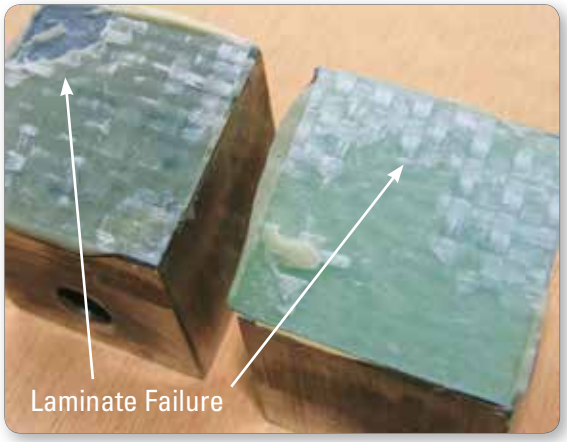
Gelcoat	Back Up Delay Time	Tensile Strain to Failure		Flexural Properties		
		First GC Crack %	Strain To Laminate Failure %	Flexural Strength (MPa)	Flexural Modulus (MPa)	GC Strain To Failure %
Crystic GC 252PA	2 hours	1.6	6.5	152	6060	2.7
Crystic GC 252PA	24 hours	2.2	6.7	159	6365	2.6
Epoxy	6 hours	2.0	7.1	109	5340	2.3

Adhesion Testing

Rigorous testing for adhesion to a number of different epoxy backing systems has been carried out. The results match a complete epoxy system. Similar results are seen across the Crystic Epoxy Bonding Gelcoat range.

Gelcoat	Back Up Delay Time	Z-direction Strength (MPa)
Crystic GC 252PA	2 hours	19.7
Crystic GC 252PA	24 hours	19.4
Epoxy	6 hours	19.9

Note 1: Values for Crystic GC 252PA used as an example. Other gelcoats in this range show similar properties.
Note 2: Results based on laminates produced with liquid epoxy backing system cured for 16 hours at 50°C.

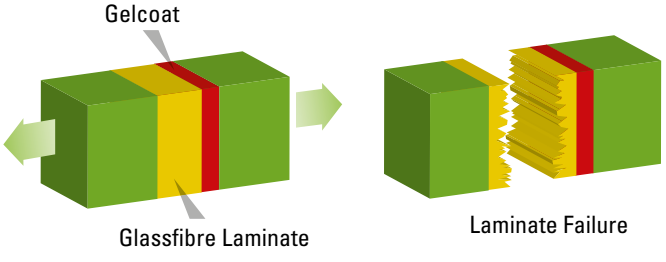


Result of GC 252PA adhesion test showing that failure is internal within the laminate

If 251PA, 252PA, 253PA or 255PA is used as a gelcoat with polyester laminating systems, then adhesion failure is likely to occur. Similarly, if the product is "double-gelled", then this is also likely to lead to adhesion failure. For these reasons, neither of these procedures is recommended.
It is recommended that customers test the gelcoat before use under their own conditions of application to ensure the required surface finish and adhesion is achieved.

Z-Direction Testing

The Z-Direction test completed on Crystic GC 252PA showed laminate failure, see image above. This proves that Crystic GC 252PA bonds effectively to epoxy substrates as the gelcoat adhesion to the epoxy laminate did not fail. Same laminate failure mode is achieved across the Crystic Epoxy Bonding Gelcoat range.



Crystic® Fireguard Range

New Technology Fire Retardant Gelcoats and Topcoats Protecting Composites from Fire

Unsaturated polyester resins used to make Glass Reinforced Plastic (GRP) are organic and like all organic compounds they will burn. Certain applications such as rail, marine, land transportation and building need systems that delay burning long enough for effective evacuation. In some areas, there is an additional focus on low levels of smoke and toxic fume emission during burning. The need for fire retardant composites is specified by the relevant national and European fire standards.

Crystic Fireguard Gelcoat 70PA	New Technology Fire Retardant, Halogen Free Low Smoke and Low Surface Spread of Flame Spray Gelcoat for the Most Stringent Fire Approvals
Crystic Fireguard Gelcoat 72PA	New Technology Fire Retardant Halogen Free Low Surface Spread of Flame Spray Gelcoat
Crystic Fireguard Gelcoat 73PA	New Technology Fire Retardant Halogen Free Low Surface Spread of Flame Brush Gelcoat
Crystic Fireguard Topcoat 75PA Excel	New Technology Intumescent Fire Retardant Topcoat, Available in Both Spray and Brush Grades

TECHNICAL PERFORMANCE BENEFITS OF CRYSTIC FIREGUARD RANGE :

- High level of fire retardancy – lower surface spread of flame
- Superior handling
- Low porosity finish
- Easy to repair
- Antimony Free
- 75PA Excel is available in a limited range of colours please ask for details. 70PA, 72PA and 73PA are available in all RAL colours

LOW SMOKE PERFORMANCE OF CRYSTIC FIREGUARD GELCOAT 70PA

- Crystic Fireguard Gelcoat 70PA with Crestapol 1212 produces less than half the amount of smoke compared to a standard fire retardant BS476 Part 7, Class 1 laminate*
- Crystic Fireguard Gelcoat 70PA with Crestapol 1212 has a 3 times lower optical density value (this measure the thickness of smoke) compared to a standard fire retardant laminate which achieves BS476 Part 7, Class 1*

* When tested to ISO 5659-2

Spread of flame on a horizontal burn test after 5 minutes*

APPROVALS

Crystic Fireguard Gelcoat 70PA
Firestarr CEN TS 45545-2 HL2 with Crestapol 1212

Crystic Fireguard Gelcoat 72PA
BS 476 Part 7, Class 1 with 1355PA, DIN5510-2 S4, SR2, ST2 with Cresatpol 1212
M1 F1 rating with Crestapol 1212

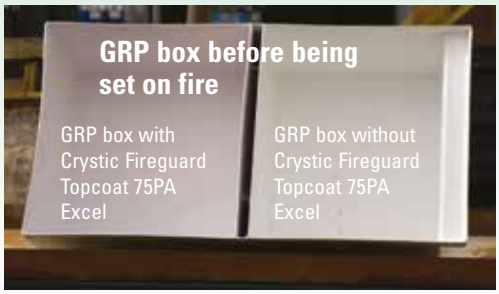
Crystic Fireguard Gelcoat 73PA
BS 476 Part 7, Class 2 with 2.3700PA modified general purpose resin

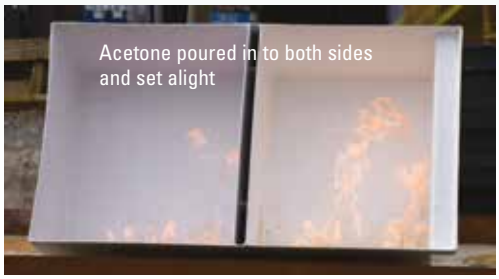
Crystic Fireguard Topcoat 75PA Excel
BS 476 Part 7, Class 1 BS476 part 6, Class 0,
M1 F1 rating with Crestapol 1212

MARKETS

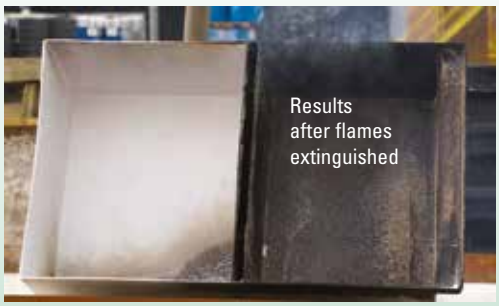
- **RAIL** – Cab Fronts, Nose Cones, Exterior and Interior Panels, Seat Shells and Tables
- **LAND TRANSPORTATION** – Buses, Coaches and Trucks
- **MARINE** – Engine Rooms
- **BUILDING AND CONSTRUCTION** – Doors, Roofs, Exterior and Interior Cladding

Crystic Fireguard Topcoat 75PA Excel External Burn Test





The fire in the box after 4 minutes clearly showing the protective properties of Crystic Fireguard Topcoat 75PA Excel on the left hand side



Typical properties of Crystic Fireguard Gelcoat 70PA		Liquid Gelcoat
Property		**Liquid**
Appearance		Opaque, coloured
Viscosity, 25°C		Thixotropic
Specific Gravity at 25°C		1.30
Stability in the Dark @ 20°C	months	3
Geltime 25°C using 2% Butanox M50 (or other equivalent catalyst)	minutes	12

Typical properties of Crystic Fireguard Topcoat 75PA Excel (B)		Liquid Topcoat
Property		**Liquid**
Appearance		Opaque, coloured
Viscosity, 25°C		Thixotropic
Liquid Specific Gravity at 25°C		1.35
Volatile Content	%	20
Stability in the Dark @ 20°C	months	2
Geltime @ 25°C using 2% Butanox M50 (or other equivalent catalyst)	minutes	10
Barcol Hardness* (model GYZJ 934-1)		40
Solid Specific Gravity at @ 25°C*		1.46

* Curing Schedule - 24 hrs at 20°C, 8 hrs at 60°C

Typical properties of Crystic Fireguard Topcoat 75PA Excel (S)		Liquid Topcoat
Property		**Liquid**
Appearance		Opaque, coloured
Viscosity, 25°C		Thixotropic
Liquid Specific Gravity at 25°C		1.35
Volatile Content	%	27
Stability in the Dark @ 20°C	months	2
Geltime @ 25°C using 2% Butanox M50 (or other equivalent catalyst)	minutes	10
Barcol Hardness** (model GYZJ 934-1)		40
Solid Specific Gravity at @ 25°C**		1.46

** Fully cured (unfilled casting)

Typical properties of Crystic Fireguard Gelcoat 72PA and 73PA		Liquid Gelcoat
Property		**Liquid**
Appearance		Opaque, coloured
Viscosity, 25°C		Thixotropic
Specific Gravity at 25°C		1.40
Stability in the Dark @ 20°C	months	3
Geltime 25°C using 2% Butanox M50 (or other equivalent catalyst)	minutes	8

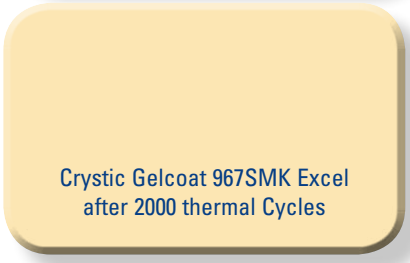
Fire Retardant Resins and Resin Systems

			EUROPEAN		GERMAN		FRENCH		UK	US		GLOBAL
			TRAIN	BUILDING	TRAIN	BUILDING	FIRE	SMOKE				
HALOGEN.	**SPECIFIC GRAVITY**	**PRODUCTS**	EN 4 5545	EN 13501.1	DIN 5510	DIN 4102	NF P 92-501	NF F 16 101	BS 476 part 6&7	UL 94	ASTM	IMO
no		**1212 + ATH 200**	HL2									
no		**1212 + ATH 170**					M1	F0				
no		**1212 + ATH 100**									E162 E662	
no		**1212 + ATH 100 + 72PA**			S4 SR2 ST2							
no		**1212 + ATH 170 + 70PA**	HL2				M1	F1			E162 E662 BSS7 239	
yes	1.37	**26026 PA**								V0		
yes	1.37	**26026 + 72PA**					M2	F2				
yes	1.54	**5046 + 72PA**					M1	F2				
yes	1.54	**356PA + 65PA**					M1	F3	Class 1			
yes	1.54	**356PA + 97PA**							Class 1			
yes	1.12	**2.406PA + TC 75PA**					M1					
no	1.12	**2-3700PA + 72PA**					M3		Class 2			
no	1.12	**2-3700PA + 73PA**					M3		Class 2			
yes	1.12	**2-8500PA + 75PA Excell**							Class 1			
yes	1.12	**2-8500PA + 75PA S**					M1					
no	1.6	**1131T + 967 FR**			S4 SR2 ST2							
no	1.6	**1131T + 72PA**					M2	F1			E162 E662 BSS7 239	
no		**343A + ATH**										A653 MCS61(67)
no		**344A + ATH**										A653 MCS61(67)
yes	1.4	**1355PA + 72PA**							Class 1			
yes	1.4	**1355PA + 65PA**							Class 2	V0		
yes	1.4	**PD9359**							Class 1			

Crystic® Gelcoat 967SMK Excel

Scott Bader has spent significant time and money in Research and Development to bring you a market leading Iso-NPG spray gelcoat for sanitaryware applications designed to offer superior technical performance.

Leading competitive gelcoat after 1200 thermal cycles



Crystic Gelcoat 967SMK Excel after 2000 thermal Cycles

Technical Performance Benefits

- ***This new formulation eliminates the industry problem of microporosity usually exposed after abrasion of the gelcoat.***
- ***967SMK Excel has improved flow without sagging to prevent costly repairs.***
- ***Initial gloss is noticeably better than competitive sanitaryware gelcoats which means less polishing is required and an enhanced surface finish is achieved.***
- ***At least 40% increase in thermal resistance compared to competitive sanitary gelcoats proven in a severe thermal shock test.***
- ***Quick cure – faster production cycle times.***
- ***Excellent chemical resistance.***
- ***Passes sanitaryware standard test NF XPD12-210 for good stain resistance.***

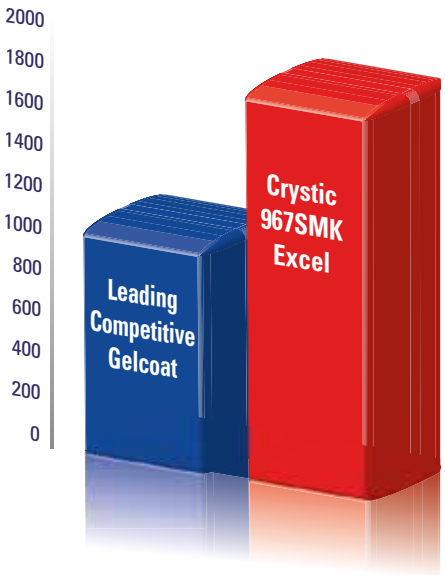
Thermal Shock Resistance

In a rigorous thermal shock resistance test, Crystic 967SMK Excel completed 2000 thermal cycles without any evidence of surface degradation. A leading competitive gelcoat revealed a damaged surface finish after 1200 thermal cycles.

Steps Within One Thermal Cycle in Test

90 seconds flow* with hot water at 75^{0}C
30 seconds dwell time
90 seconds flow* with cold water at 15^{0}C
30 seconds dwell time

*Flow rate : 4 litres/minute



The graph demonstrates 967SMK Excel provides significantly better thermal shock resistance than a leading competitor gelcoat.

Product Range

Crystic Gelcoat 967SMK Excel
for airless spray equipment applications

Crystic Gelcoat 967SMK Excel
for gravity gun applications

Crystic Microban Gelcoat 967SMK Excel
for applications requiring antibacterial protection against common bacteria and fungus

Crystic Gelcoat 997SMK
for applications requiring a water clear chemical resistant gelcoat

Applications :

The specially designed formulation makes Crystic Gelcoat 967SMK Excel an ideal choice for demanding sanitaryware applications where surface quality and long-term performance is essential.

- **Bathroom sinks**
- **Baths**
- **Shower trays**
- **Shower cabins**

Sanitaryware Markets

- **Domestic and commercial properties**
- **Hospitals**
- **Hotels**
- **Public Buildings**
- **Luxury Yachts**
- **Cruise liners**

A leading European sink manufacturer has chosen 967SMK Excel as it has outstanding thermal shock resistance compared to competitive products and has zero microporosity after abrasion of the gelcoat.

Mechanical Data for Gelcoat 967SMK Excel in Cured State

Product	967SMK Excel	Leading Competitive Gelcoat
Tensile Elongation	3	2
Tensile Strength	70	64
Tensile Modulus	3400	3800
Barcol Hardness	45	45
HDT (1.80MPa)	90	83

Physical Data for Gelcoat 967SMK Excel in Liquid State

Product	967SMK Excel
Viscosity @ 2.5rpm (dPas)	300
Thixotropic Index	6
Specific Gravity	1.18
Geltime 2% Catalyst M @ 25°C (mins)	8

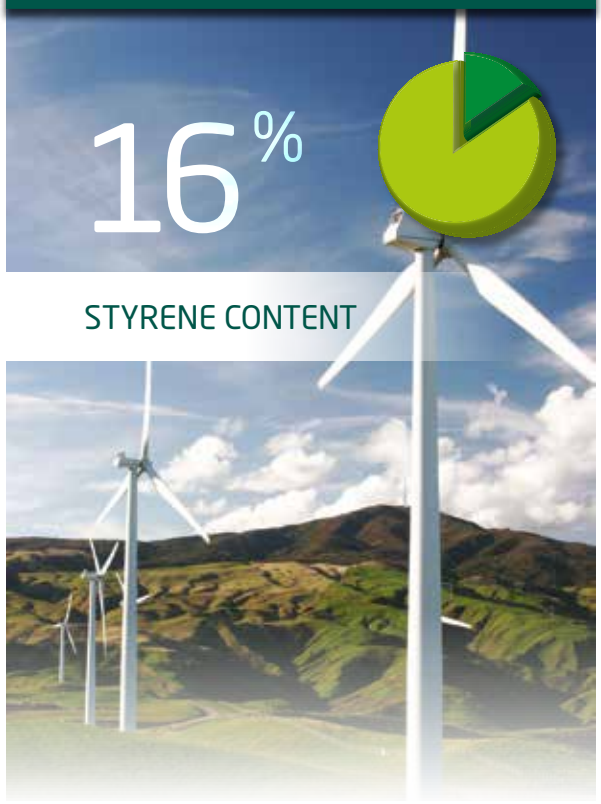
Crystic® Ecogel Family of Low Styrene Gelcoats

Ultra-low styrene content spray gelcoats, designed for use in a variety of end applications

Ecogel®

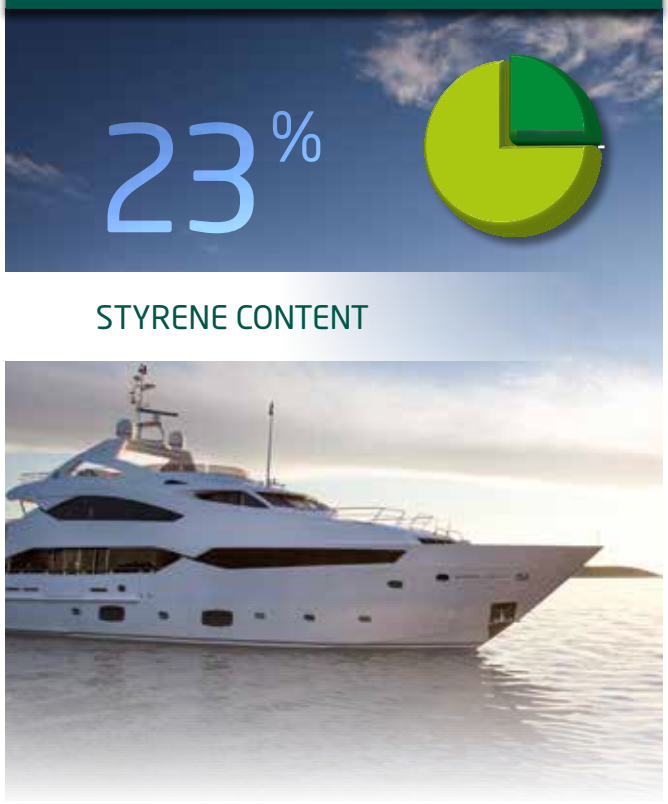
New

Crystic® Ecogel S1PA

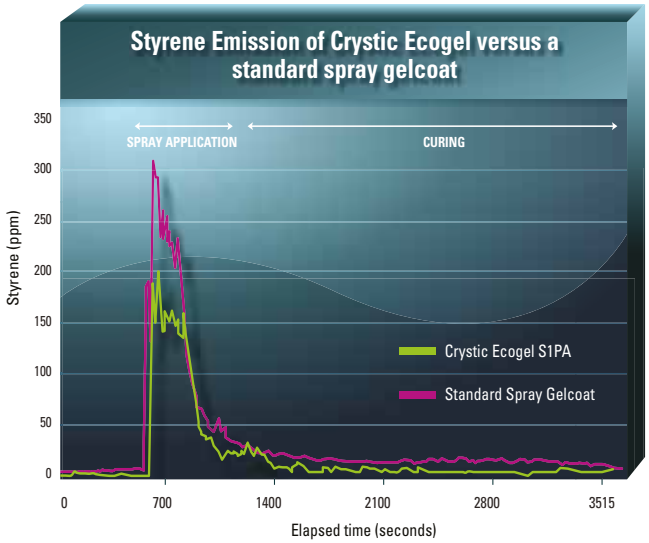


Market leading, ultra-low styrene gelcoat, suitable for wind energy and industrial applications.

Crystic® Ecogel Marine S3PA



Superior weathering low VOC Isophthalic NPG marine gelcoat, designed for the production of high quality marine parts. Available in both white and off-white colours.



FEATURES	BENEFITS
Iso NPG base resin	Excellent water / blistering resistance
High elongation	Good impact resistance
Excellent weathering performance	Reduced yellowing and colour change
Easy to apply	Excellent surface aspect
Low styrene content	Better working conditions for workers, and less styrene emissions in the work place
Low VOC emission	Low impact on environment

All Ecogel products contain zero acetone content and can be used with Butanox M50.

Crystic® Ecogel Ultra-Low Styrene Content Spray Gelcoat

Designed for use in general moulding, transportation, wind energy and building applications

Ecogel®

LM Wind Power Case Study

LM Wind Power Blades has been a market leader in the manufacture and supply of wind turbine blades for over three decades now. This has been achieved over the years through an unwavering commitment to continuous improvement, quality, cost, research, product development and excellent customer service.

"LM Wind Power now uses Scott Bader's ultra-low styrene gelcoat products in its plants globally, and has seen a major reduction (more than 50%) in styrene emissions during spray gelcoat application, without any loss of performance and using the same standard spray equipment and catalysts as with conventional gelcoats. The use of Scott Bader's ultra-low styrene gelcoats has enabled LM Wind Power to greatly improve the environment for our workers and meet our own demanding in-house HSE standards."

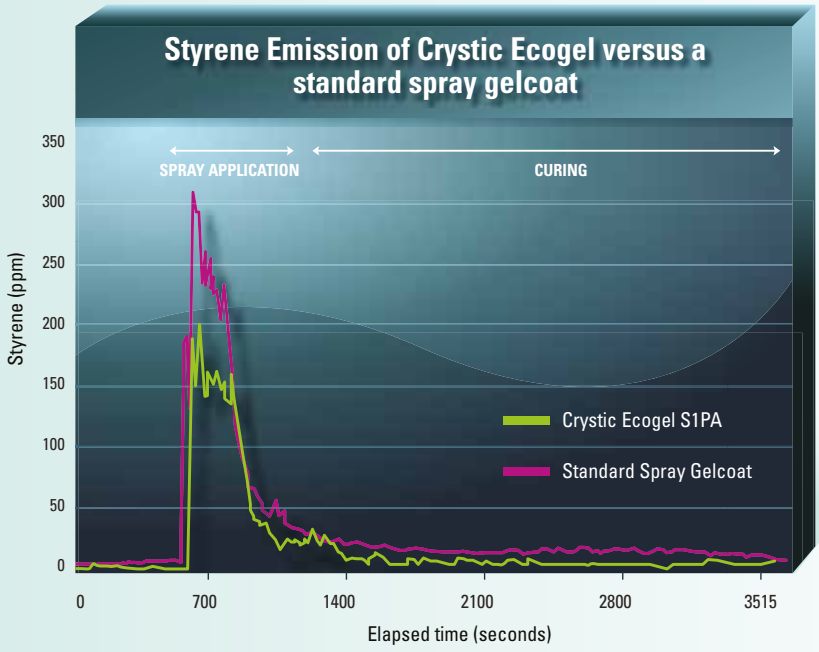
Dan Lindvang, Senior Manager, Global Equipment Engineering"

Independent laboratory tests confirm that

Crystic Ecogel S1PA

can cut total styrene emissions by over **55%** compared to using a standard technology polyester spray gelcoat when sprayed using extraction equipment with an air flow rate of 5000m³/hr

- Good weathering resistance
- Good interlaminar adhesion with standard polyester and vinylester resins
- Noticeably lower styrene smell emitted from the gelcoat
- Good gloss
- The gelcoat film will be ready for laminating approximately 1 hour after spray application



Tests show Crystic Ecogel S1PA has a much lower VOC emission for both the dynamic phase (airless spray) and static phase (gelation) than a standard spray gelcoat

Guidelines for use

Spray apply Crystic Ecogel S1PA using same technique as a standard gelcoat

Cures with a standard MEKP catalyst

Apply wet film thickness of 0.5-0.6mm

Ensure workshop temperatures are above 18°C

The 1st layer of laminate should be applied on the same day as the gelcoat

LAMPLAS Polymer Engineering Case Study

LAMPLAS Polymer Engineering are one of the largest composite general moulders in the UK and supply parts to many industries.

"Crystic Ecogel is very low in odour and does cut styrene emissions significantly whilst still exhibiting a glossy, low porosity surface finish on the finished part. Our laminators are able to spray the gelcoat following the same technique used with a conventional spray gelcoat and use our standard catalyst. I am really pleased that Scott Bader are innovating with new technology like this to help us comply with health and safety regulations."

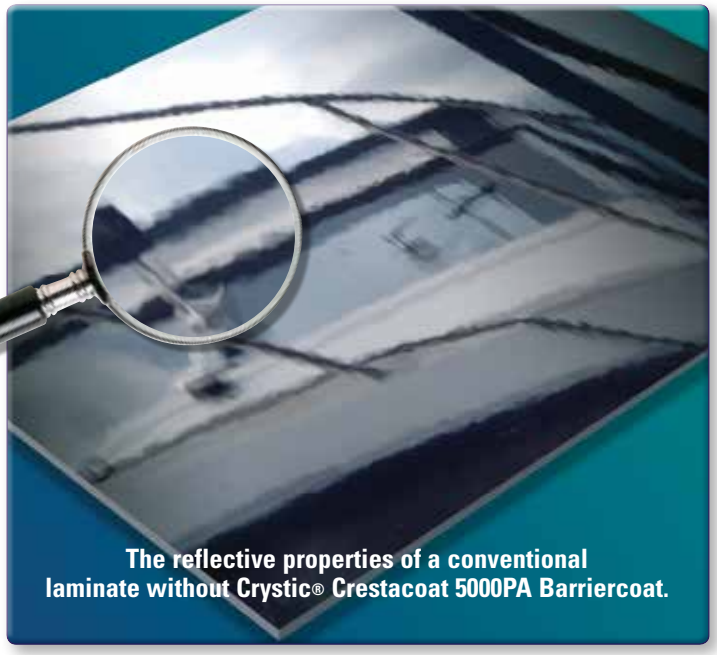
Keith Siddle, Operations Director

Properties for Crystic Ecogel S1PA	Typical Result
Viscosity, 25°C 0.6s^{-1}	300 poise
Viscosity, 25°C 4500s^{-1}	2.6 poise
Specific Gravity at 25 °C	1.25
Stability at 20°C	3 months
Styrene Content (wt)	16 %
Geltime 20 °C 1.5 % Butanox M50 (or equivalent catalyst)	15 - 20 mins

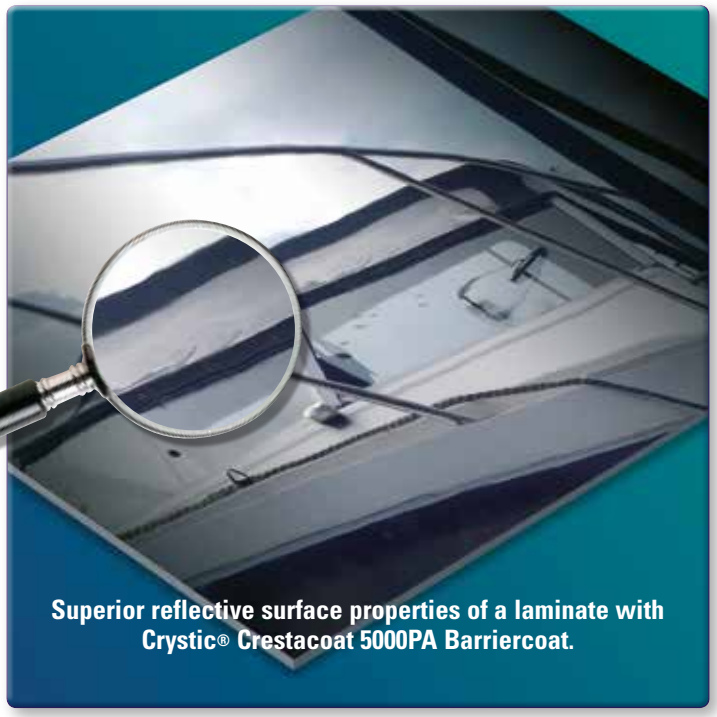
Mechanical properties	Value
Barcol Hardness (Model 934-1)	48
Heat Deflection Temperature*	95 °C
Water Absorption 24 hours at 23°C	18 mg
Tensile Modulus	4 GPa
Elongation at Break	2.4 %
Tensile strength	48 MPa

Crystic® Crestacoat 5000PA

A new technology barriercoat designed to significantly improve gelcoat surface aesthetics, creating a glassy, high lustre, ultra smooth finish



The reflective properties of a conventional laminate without Crystic® Crestacoat 5000PA Barriercoat.



Superior reflective surface properties of a laminate with Crystic® Crestacoat 5000PA Barriercoat.

Use it for making superior surface finish parts -

Fibre pattern and orange peel can often be seen on a gelcoat surface causing an undesirable gelcoat finish; darker colours, complex shapes and infused parts are especially prone to these defects. These common gelcoat surface defects can be dramatically reduced by applying a 1mm thick layer of Crystic® Crestacoat 5000PA behind the gelcoat.

Superior 'Matched System' Performance -

Crystic® Crestacoat 5000PA has been matched with Crystic® VE679PA skincoat to give the best possible surface finish and the added advantage of outstanding osmotic blistering resistance, proven in a rigorous 12-month test. This matched system can be used with confidence for marine applications or for parts used in other demanding environments, where surface aesthetics are critical.

Unique Formulation & Performance -

Crystic® Crestacoat 5000PA is based on innovative urethane acrylate technology unique to Scott Bader. The unique formulation has been proved technically to outperform both vinylester and polyester barriercoats. Use it with the knowledge that it comes with the proven quality guarantees associated with Scott Bader.

Markets

- Marine
- Land Transport
- Building
- Industrial
- Applications that require a superior gelcoat surface finish

Crystic® Crestacoat 5000PA

FEATURES & BENEFITS

- **Superior Surface Finish -**
  Wave-scan Distinctiveness of Image (DOI) measurement (appearance standard in the automotive industry) proves Crystic® Crestacoat 5000PA is significantly better than both polyester and vinylester barriercoats in achieving a glassy, high definition, deep lustre gelcoat surface finish. The results achieved on the laminate built using Crystic® Crestacoat 5000PA would even significantly outperform many automotive spray painted parts.

- **Interlaminar Adhesion -**
  Its tough, strong, flexible urethane acrylate resin backbone, as used in Scott Bader's Crystic Crestomer® structural adhesive range of products, ensures excellent adhesive properties within the laminate.

- **Use less than competitive materials -**
  Only 1mm thickness is required to achieve all the product advantages.

- **Easy to apply and use –**
  It can be sprayed or applied by brush and is very easy to use.

- **Lightweight Formulation –**
  This means only 600g/m² is required to achieve the recommended 1mm thickness.

- **Laminate Flexibility –**
  Improved by using Crystic® Crestacoat 5000PA which helps prevent gelcoat cracking.

- **Low Exotherm –**
  This means that when applied at a thickness of 1mm, Crystic® Crestacoat 5000PA can be used with confidence on very large structures.

- **Matched System –**
  Crystic® Crestacoat 5000PA has been matched for use with Crystic® VE679PA skincoat resulting in a system proven to give the best surface finish.

- **Radius compound –**
  It is an ideal product for making superior quality complex parts with sharp corners, as its flexible properties reduce air voids, cracking and pre-release in moulded parts where there is sharp radius in the design.

- **Blistering Resistance -**
  A rigorous 12-month test has proven that Crystic® Crestacoat 5000PA can be used with confidence in a marine environment behind a Crystic high performance marine grade gelcoat with Crystic VE679PA skincoat.

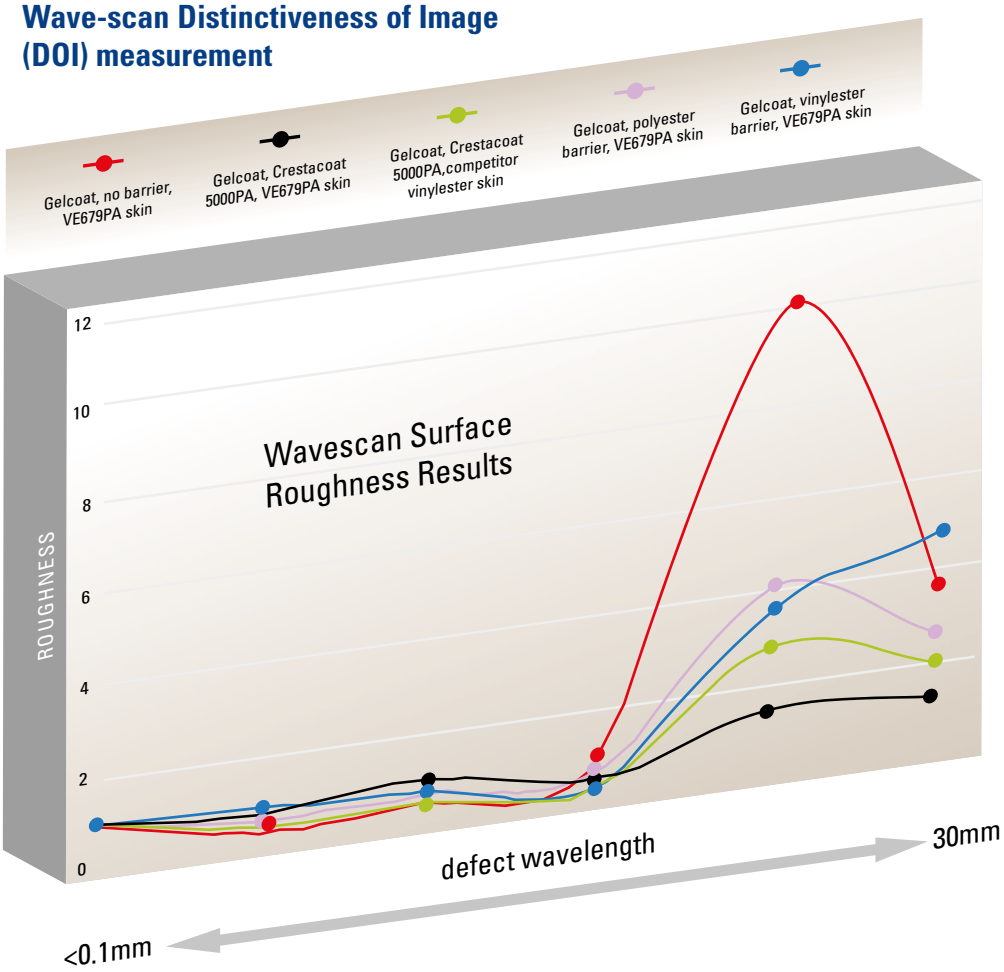
- **Long-term surface quality –**
  Laminates constructed using Crystic® Crestacoat 5000PA maintained a superior surface quality after being submerged in water at 40°C for 12 months, proving that it helps to maintain a high quality surface finish in the long term.

The paste is firstly catalysed and mixed thoroughly.

The Crystic Crestacoat 5000PA can then be applied by brush for smaller areas.

Or by spray to cover larger areas quickly and evenly.

Wave-scan Distinctiveness of Image (DOI) measurement



Short and long wave roughness

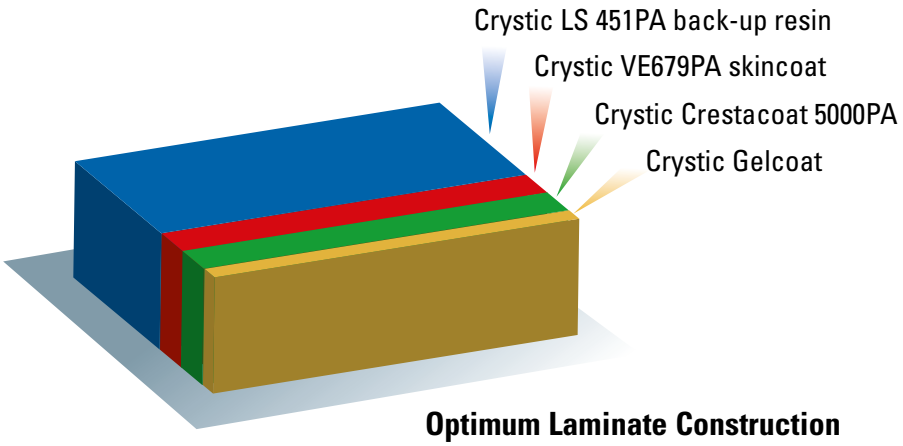
The quality of a surface differs depending if viewed close-up or far away. Hence surface waviness, or 'orange-peel', has historically been characterised using two key criteria, namely the short and long wave roughness of a surface.

Short wave roughness is observable at close ranges, around 40cm, affected by the smoothness of reflected edges.

Long wave roughness is best observed at around 3m distance and is affected by larger defects around the 1-10mm wavelength; at this distance, a high quality surface should almost look as if it is wet. The wave-scan graph shows data comparing combinations of different gelcoats and barriercoats. Crystic Crestacoat 5000PA backed with Crystic VE679PA shows surface aesthetics superior to all other combinations. These results would even significantly outperform many spray painted parts in the automotive industry.

Crystic Crestacoat 5000PA is designed to be used behind a standard gelcoat and should be applied when the gelcoat has reached sufficient cure for normal lamination to take place. It can be brushed or sprayed to a thickness of 1mm. It is recommended that the barrier gel layer is as even as possible.

As a guide, approximately 600g/m^2 of Crystic Crestacoat 5000PA will give the required thickness when evenly applied.



Optimum Laminate Construction

Typical Properties		
Property	**Unit**	**Liquid Crystic Crestacoat 5000PA**
Appearance		Light blue paste
Viscosity @ 25°C		Thixotropic
Specific gravity @ 25 °C		0.6
Stability in the dark @ 20 °C	months	3
Geltime (@ 25 °C using 2% Catalyst M / Butanox M50®)	minutes	25

Typical Properties		
Property	**Unit**	**Fully cured* Crystic Crestacoat 5000PA**
Shore Hardness		70
Deflection temperature under load ** (1.80MPa)	°C	58
Tensile Modulus	MPa	1050
Tensile Strength	MPa	17
Elongation at break @ 20°C	%	3.5

* Curing schedule – 24 hours @ 20°C, 3 hours @ 80°C

** Curing schedule – 24 hours @ 20°C, 5 hours @ 80°C, 3 hours @ 120°C

Packaging

Crystic Crestacoat 5000PA is supplied in 15kg containers.

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