Advanced Gelcoats, Adhesives and Crestapol® Resins for Land Transport Applications

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By Sergio Velosa
For land transport we offer:

- **Crystic® Gelcoats**
- **Adhesives**
- **Crestapol® Resins**
Scott Bader Headquarters
Wollaston, UK
Over 65 Years of Reliability, Experience and Innovation
Scott Bader Group Turnover in 2014 was £186m
Crystic® Gelcoats
For
Land Transport
Crystic® Gelcoats have been used in the Transport Market for over 50 years in Luxury Cars, Recreational Vehicles, Buses, Trucks, Vans, Caravans, Horse Boxes, Rail…
Crystic® Gelcoats for land transport are designed to outperform competitive gelcoats in the following areas -

- Excellent long-term performance
- Minimal porosity
- Easy to sand
- Excellent gloss retention
- Superior flexibility – crack resistance
- Excellent fire performance properties, especially when in combination with Crestapol® FR resins.
Weathering Tests

• Florida (12 months)
• Xenon (1000 hours)
• QUVA (1000 hours)

Blistering Test

• 12 month water immersion at 40°C
Iso & Iso-NPG spray Gelcoats for superior weathering with low styrene emissions

- **Crystic® LS96PA Spray Gelcoat**
  Low styrene content filled gelcoat with good handling properties

- **Crystic® LS97PA Spray Gelcoat**
  Low styrene content superior weathering gelcoat with excellent water resistance

- **Crystic® Ecogel**
  Market leading technology spray gelcoat with only 16% styrene content which may cut styrene emissions by over 50%

- **Crystic® LS30PA Iso-NPG Spray Gelcoat**
  Superior Weathering Iso/NPG Spray Gelcoat
New technology fire retardant, halogen free, designed to protect composites from fire

- **Crystic® Fireguard Gelcoat 70PA**
  Low Smoke and Low Surface Spread of Flame Spray Gelcoat for the Most Stringent Fire Approvals

- **Crystic® Fireguard Gelcoat 72PA**
  Low Surface Spread of Flame Spray Gelcoat

- **Crystic® Fireguard 75PA (IMS) Excel**
  Intumescent fire retardant gelcoat for spray application
  Meets BS476 Part 7 class 1 with 1355PA and M1 with Crestapol® 1212
High Performance Vinylester Spray Gelcoat

Crystic® 15PA
Superior performance VE spray tooling gelcoat for making moulds designed to have a long service lifetime and retain high gloss levels after multiple pulls

Key benefits:
• Easy to spray and achieve good coverage
• Superior gloss retention
• Very low porosity surface
• Use with a standard MEKP catalyst
Crestabond® Adhesives
For
Land Transport
Two component Methacrylate Adhesives (Activator & Adhesive)
• Based on Acrylic technology
• High performance, high strength
• Room temperature cure
• Range of cure speeds
• Ability to bond dissimilar substrates
• Alternative to Urethanes and Epoxies
• 3 main groups of substrates to bond to: Metals, Composites & Plastics
Market Applications

Automotive

Marine

Land transportation

Renewable energy

Pipes & tanks

Building & Construction
<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Colour</th>
<th>Mix ratio by volume</th>
<th>Viscosity (cP)</th>
<th>Working Time (mins)</th>
<th>Fixture Time (mins)</th>
<th>Tensile Elongation (%)</th>
<th>Tensile Strength (MPa)</th>
<th>Tensile Modulus (MPa)</th>
<th>Gap Fill (mm)</th>
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<tbody>
<tr>
<td>M1-04</td>
<td>Universal Bonder</td>
<td>Grey</td>
<td>10:1</td>
<td>100,000 - 140,000</td>
<td>3 - 5</td>
<td>8 - 10</td>
<td>70</td>
<td>14 - 17</td>
<td>400 - 600</td>
<td>1 - 15</td>
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<tr>
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<td>Universal Bonder</td>
<td>Grey or Black</td>
<td>10:1</td>
<td>100,000 - 140,000</td>
<td>4 - 7</td>
<td>12 - 18</td>
<td>70</td>
<td>14 - 17</td>
<td>400 - 600</td>
<td>1 - 15</td>
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<tr>
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<td>10:1</td>
<td>100,000 - 140,000</td>
<td>16 - 22</td>
<td>25 - 35</td>
<td>70</td>
<td>16 - 19</td>
<td>600 - 850</td>
<td>1 - 25</td>
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<td>10:1</td>
<td>200,000 - 240,000</td>
<td>25 - 35</td>
<td>60 - 80</td>
<td>&gt;100</td>
<td>17 - 20</td>
<td>750 - 1000</td>
<td>1 - 50</td>
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<td>Grey</td>
<td>10:1</td>
<td>200,000 - 240,000</td>
<td>50 - 70</td>
<td>150 - 180</td>
<td>&gt;100</td>
<td>16 - 18</td>
<td>650 - 850</td>
<td>1 - 50</td>
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<tr>
<td>M1-90HV</td>
<td>Universal Bonder</td>
<td>Off White</td>
<td>10:1</td>
<td>340,000 - 380,000</td>
<td>80 - 100</td>
<td>210 - 240</td>
<td>60</td>
<td>20 - 25</td>
<td>1400 - 1800</td>
<td>1 - 50</td>
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<tr>
<td>M7-05</td>
<td>Universal Bonder</td>
<td>Off White or Black</td>
<td>1:1</td>
<td>30,000 - 70,000</td>
<td>4 - 7</td>
<td>18 - 22</td>
<td>35</td>
<td>23 - 25</td>
<td>1200 - 1700</td>
<td>1 - 5</td>
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<tr>
<td>M7-15</td>
<td>Universal Bonder</td>
<td>Off White or Black</td>
<td>1:1</td>
<td>30,000 - 70,000</td>
<td>10 - 20</td>
<td>30 - 45</td>
<td>33</td>
<td>22 - 24</td>
<td>1200 - 1700</td>
<td>1 - 5</td>
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Pack Sizes
• 10:1 = 50ml side by side cartridges
• 10:1 = 400ml co-axial cartridges
• 10:1 = 825ml side by side cartridges
• 1:1 = 50ml side by side cartridges
• 1:1 = 400ml side by side cartridges
• 20 litre pails (18kg)
• 200 litre drums (180kg)

Dispensing Equipment for Cartridges, 10:1 and 1:1
• Manual gun 10:1 and 1:1
• Pneumatic gun 10:1 and 1:1

Dispensing Equipment for Bulk Applications, 10:1 and 1:1
• 20 litre pails and 200 litre drums require machines that can be arranged via Scott Bader partners
• No primer required on any substrates
• Minimal surface preparation needed
• Excellent fatigue and impact resistance
• Range of working and fixture times
• Good resistance to water, diesel and other common chemicals
• Good gap filling capability: 1mm – 50mm
• High elongation reducing stress on parts
• Service temperature from -40°C to +100°C
• Transportation Trailer Applications

Aluminium Corner Profiles

Bonding Al stiffeners to ABS roof skin in horse boxes
Case Studies & Applications

- Transportation Bus Applications

One piece aluminium roof bonding

Body panel bonding.
Front and rear end caps, roof profiles
Case Studies & Applications

• Transportation Truck Applications

Stowage Lockers

Truck Cabs (Hoods, Fairing, Bumpers, Wheels arches, Wing mirrors, etc.)
Case Studies & Applications

- Transportation Train Applications

GRP front and rear end caps

Aluminium panels, Stainless Steel fittings

Internal Bonding (window surrounds, heating ducts floors, ceiling panels, light boxes)
Crestapol® Resins
For
Land Transport
Crestapol® 1212
High performance resin for highest fire smoke & toxic fume for land transport applications.

**Characteristics:**

- Urethane Acrylate resin in styrene/methyl methacrylate
- Tough, low viscosity resin for closed mould, infusion and pultrusion
- Can be heavily filled with ATH for the very highest Fire, Smoke and Toxic Fume performance
- High toughness for demanding applications
- High quality technical support for formulation development, production trials etc.
Fire Performance

High levels of Aluminium Trihydrate (ATH) can be incorporated to achieve a range of stringent fire, smoke & toxic fume standards. For example, 170phr ATH can achieve M1, F0 to the French Epiradiateur standards.
Crestapol® 1212
Applications

- Numerous projects using vacuum infusion in Spain and China for FST rail type applications. (Flooring, wall/construction panels, etc)
- Used heavily throughout the UK and Europe for FST pultruded sections.
Crestapol® 1212
Rail Applications

• **China High Speed Train** - VIP Chairs
  
  ![China High Speed Train](image1)
  
  **FR Standard:**
  German DIN 5510, S4/SR2/ST2

• **Spain Madrid Metro** - Gate Post
  
  ![Spain Madrid Metro](image2)
  
  **FR Standard:**
  Spanish M1 F1
Crestapol® 1212
Rail Applications

• **Bangkok Subway** - Interior parts and Chairs
  
  FR Standard:
  German DIN 5510,
  S4/SR2/ST2

• **Europe Train** - Carrier cover board
  
  FR Standard:
  French NFP 92-501 M1 F2
Low viscosity urethane acrylate type resin suitable for infusion, RTM and similar processes at room temperature

Key features:
• Excellent mechanical performance and durability
• High temperature performance
  Tg 130°C / HDT 109°C
• Compatible with CF and general purpose sizing agents
• Can process/ manufacture as with a polyester/ vinylester and achieve improved properties
• Excellent surface finish with minimal fibre print through
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