Composite and speciality materials for Urban Air Mobility
Urban Air Mobility on the rise - Partner with Solvay!

Urban Air Mobility (UAM) is an emerging market that will revolutionize the transportation and aviation industry. These innovative platforms will accelerate the transition to emission free and sustainable, on demand, passenger and cargo air transit. The benefits of UAM encompass delivery of essential services to remote rural locations to decongesting large metropolitan cities across the globe.

UAM innovators require industry partners that fully understand customer needs and Solvay is best positioned to assist. Our broad portfolio of qualified Aerospace materials alongside our application engineering expertise allows us to support customers from the prototyping stage right through to commercialization.

Our 40+ years of Aerospace experience alongside our Automotive knowledge will prove invaluable when it comes to meeting the unique regulatory and material performance requirements of each of our customers no matter how large or small.

Solvay is your partner for multi-material solutions tailored to the UAM market needs and will support you in every step of the process from concept and testing to commercialization.
Where and why to use advanced materials on UAM platforms

Primary Structures
Fan/rotor blades, landing gear, structural sandwich, skins, stringers, frames, spars, ribs, beams, leading edges, nacelles

NCAMP-qualified material systems
Proven materials on primary structures
Lower certification costs and risk

Our teams are here to assist and support you in selecting the right material, for the right process and for the right application.

Non-structural Parts
Interiors, non-structural fairings, covers, ducting, attachments, clips, brackets

Secondary Structures
Doors, fairings, floor panels, high temp applications, interior structures, antenna, nose, tailcone, cabin

NCAMP-qualified material systems
Process flexibility
Manufacturing and structural simulation

Cost effective material solutions meeting functional requirements
Visual surface quality
Material systems supporting manufacturing process flexibility
### Product selector guide for Structural Applications

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Key Attributes</th>
<th>Temperature Performance</th>
<th>Cure/Consolidation Process</th>
<th>Reinforcement</th>
<th>Product Forms</th>
<th>Design Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYCOM® EP2190</td>
<td>Structures Propulsion</td>
<td>• Highly toughened epoxy with exceptional damage tolerance and durability on thin laminates &amp; UD structures</td>
<td>190°C / 140°C</td>
<td>● ● ● ● ●</td>
<td>S2 Glass</td>
<td>● ● ● ●</td>
<td>NCAMP³</td>
</tr>
</tbody>
</table>
| MTM® 45-1 | Structures | • Toughened epoxy with wide processing window and cure temperature flexibility even for sandwich structures  
• Low density resin = 2 to 4% weight benefit over legacy aerospace systems | 200°C / 160°C | ● ● ● ● ● | S2 Glass Quartz | ● ● ● | NCAMP |
| CYCOM® EP2750 | Structures | • Toughened epoxy with exceptionally high notch properties  
• Design for press cure and compatible with advanced forming technologies (less than 30 minutes) | 190°C / 165°C | ● ● ● ● ● | ● ● | ● | NCAMP³ |
| MTM® 46 | Structures Secondary Structures | • Mid-toughened epoxy  
• Large processing window and cure temperature flexibility even for sandwich structures  
• Press curing options down to 20 minutes | 190°C / 120°C | ● ● ● ● ● | ● ● | ● | Solvay |
| APC PEKK FC | Structures Propulsion Battery Enclosures | • High toughness and damage tolerance  
• Good resistance to a wide range of fluid environments  
• Outstanding FST and OSU heat release properties  
• Low moisture uptake (<0.3 % by wt.) | 160°C / 155°C | ● ● ● ● ● | ● | ● | Solvay |
| APC-2 (PEEK) | Structures Propulsion Battery Enclosures | • Very high toughness, damage tolerance, and good wear resistance  
• Excellent environmental resistance  
• Good resistance to creep and fatigue  
• Outstanding fire resistance | 145°C /140°C | ● ● ● ● ● | S2 Glass | ● ● | Solvay |
| Evolite™ PPS² | Secondary Structures | • Low moisture uptake  
• Excellent chemical resistance  
• Outstanding FST and OSU heat release properties | 90°C / 85°C | ● ● ● ● ● | ● | ● | Solvay |

1 Developmental Product  
2 Based on onset Tg per DMA  
3 In process
**Product selector guide for Other Applications**

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Key Attributes</th>
<th>Temperature Performance</th>
<th>Cure Process</th>
<th>Reinforcement</th>
<th>Design Data</th>
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</thead>
<tbody>
<tr>
<td>CYCOM® PR520</td>
<td>Structures Propulsion</td>
<td>• One part highly toughened RTM resin with low viscosity</td>
<td>160°C / 135°C</td>
<td>VBO</td>
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<td>AGATE</td>
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<td></td>
<td></td>
<td>• Low exotherm / thick part production capable</td>
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<td>Autoclave</td>
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<td>• Low moisture absorption, ~0.6%</td>
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<td>Press</td>
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<td>• Fully compatible binder available</td>
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<td>RTM</td>
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<td>Infusion</td>
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<tr>
<td>PRISM® EP2400</td>
<td>Structures</td>
<td>• One-part toughened resin system with excellent compression strength</td>
<td>180°C / 135°C</td>
<td>VBO</td>
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<td>NCAMP²</td>
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<td>and damage tolerance</td>
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<td>Autoclave</td>
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<td></td>
<td>• Wide processing window</td>
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<td>Press</td>
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<td></td>
<td>• High strain enhances fatigue and micro-crack resistance</td>
<td></td>
<td>RTM</td>
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<tr>
<td>CYCOM® 6000 &amp; 2200 Series</td>
<td>Interiors</td>
<td>• Phenolic resin systems developed specifically for</td>
<td>Service temp up to 260°C</td>
<td>VBO</td>
<td></td>
<td>Aramid</td>
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<tr>
<td></td>
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<td>aircraft interior laminates and crushed-core panels</td>
<td></td>
<td>Autoclave</td>
<td></td>
<td>Solvay</td>
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<td></td>
<td></td>
<td>• Self-extinguishing and low smoke</td>
<td></td>
<td>Press</td>
<td></td>
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<tr>
<td>MTM® 348FR</td>
<td>Interiors</td>
<td>• Epoxy, Excellent mechanical properties</td>
<td>160°C / 105°C</td>
<td>VBO</td>
<td></td>
<td>Solvay</td>
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<td>in addition to exceptional fire smoke and toxicity</td>
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<td>Autoclave</td>
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<td></td>
<td>• Self-extinguishing and low smoke</td>
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<td></td>
<td>Battery Enclosures</td>
<td>• Good hot and wet performance and impact</td>
<td>140°C / 100°C</td>
<td>VBO</td>
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<td>Aramid</td>
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<td></td>
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<td>resistance</td>
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<td>Autoclave</td>
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<td>S2 Glass</td>
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<td></td>
<td>• Excellent surface finish and visual quality</td>
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<td>Press</td>
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<td>Solvay</td>
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<td>characteristics</td>
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<td>cure</td>
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<td></td>
<td></td>
<td>• Press curing options down to 15 minutes</td>
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<td>options</td>
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<tr>
<td>MTM® 58B</td>
<td>Secondary Structures</td>
<td>• Good hot and wet performance and impact</td>
<td>210°C Dry Tg</td>
<td>VBO</td>
<td></td>
<td>Solvay</td>
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<td></td>
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<td>resistance</td>
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<td>Autoclave</td>
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<td>• Excellent surface finish and visual quality</td>
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<td>Press</td>
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<td>• Press curing options down to 15 minutes</td>
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<td>options</td>
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<tr>
<td>LTM® 210 Series</td>
<td>Tooling</td>
<td>• Industry standard low initial temperature curing</td>
<td>257°C Dry Tg</td>
<td>VBO</td>
<td></td>
<td>Solvay</td>
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<td></td>
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<td>epoxy tooling materials</td>
<td></td>
<td>Autoclave</td>
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<td>• Optimized for molding 180°C curing epoxy</td>
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<td>Press</td>
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<td>components with match component CTE</td>
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<td>RTM</td>
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<td>• Allows for the use of low cost, low temperature</td>
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<td>Infusion</td>
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<td>master models</td>
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<tr>
<td></td>
<td>Tooling</td>
<td>• High-performance bismaleimide (BMI) resin/</td>
<td>210°C Dry Tg</td>
<td>VBO</td>
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<td>Solvay</td>
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<tr>
<td></td>
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<td>carbon fiber tooling system</td>
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<td>Autoclave</td>
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<td>• Machinable tool surface for maximum accuracy</td>
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<td>Press</td>
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<td>over large areas</td>
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<td>RTM</td>
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<td></td>
<td></td>
<td>• Capable of continuous service at 190°C and</td>
<td>257°C Dry Tg</td>
<td>VBO</td>
<td></td>
<td>Solvay</td>
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<td></td>
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<td>short cycle service at 204°C</td>
<td></td>
<td>Autoclave</td>
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<td></td>
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<td>• Long Thermal Oxidative stability during</td>
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<td>Press</td>
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<td></td>
<td></td>
<td>190°C service</td>
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<td>RTM</td>
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</tbody>
</table>

1 Based on onset Tg per DMA
2 In process
<table>
<thead>
<tr>
<th>Product</th>
<th>Application1</th>
<th>Key Attributes</th>
<th>Temperature Performance</th>
<th>Reinforcement</th>
<th>Design Data</th>
</tr>
</thead>
</table>
| Torlon® PAI     | Gears, clips, brackets | • Best-in-class friction and wear performance  
• Excellent strength and toughness  
• Excellent resistance to a wide range of chemicals  
• Inherent flame resistance  
• Low CLTE | 265°C | CF  | GF  | LGF  | Solvay |
| KetaSpire® PEEK | Gears, body, housing | • Excellent strength-to-weight ratio  
• Superior hot/wet performance  
• Long-term thermal-oxidative stability up to 240°C  
• Best-in-class fatigue and creep resistance  
• Outstanding chemical resistance  
• Inherent flame resistance | 150°C - 170°C2 | CF  | GF  | Solvay |
| AvaSpire® PAEK  | Gears, body, housing | • Higher stiffness from 150°C to 190°C vs PEEK  
• Improved ductility and toughness vs PEEK  
• Equal or better chemical resistance vs PEEK  
• UL-94 V0 rating at 0.8 mm  
• Comparable strength and stiffness at up to 30% lower cost  
• Excellent aesthetics and colorability | 150°C | CF  | GF  | Solvay |
| Ryton® PPS      | Propeller, housing | • Thermal stability  
• Chemical resistance  
• Dimensional stability  
• Inherent flame retardancy | 85°C | CF  | Solvay |
| Amodel® PPA     | Propeller, housing, landing gear | • Very high strength and stiffness at elevated temperatures  
• Excellent retention of mechanical properties in humid environments  
• High resistance to a broader range of chemicals  
• Continuous-use from 120-185°C  
• Heat deflection temperatures up to 310°C  
• HFFR grades available | 88°C - 165°C4 | CF  | Solvay |
| Ixef® PARA      | Propeller, housing, landing gear | • High strength and rigidity  
• Excellent surface appearance  
• High flow for thin-walled parts  
• Low and slow moisture uptake  
• Halogen-free flame retardant grades | 85°C | CF  | Solvay |

1 Mainly applies to small drones  
2 Based on onset Tg per DMA  
3 KetaSpire XT is the highest temperature PEEK in the industry  
4 Amodel Supreme, the Industry’s highest performing PPA
## Ancillary Products

Solvay has an extensive line of ancillary products suitable for the Urban Air Mobility market. The items below represent a portion of our portfolio of materials.

<table>
<thead>
<tr>
<th>Product Family</th>
<th>Product Names</th>
<th>Key Attributes</th>
</tr>
</thead>
</table>
| **Film Adhesive**               | FM® 209-1      | - Excellent combination of peel and shear properties from -55°C to 120°C  
- Resistance to both pre-bond and post-bond humidity  
- Capable of curing below 120°C and Service temperature of 120°C |
|                                 | FM® 300-2      | - Offers service temperatures from -55°C to 149°C  
- Excellent moisture and corrosion resistance in high humidity environments with no significant reduction in mechanical properties  
- Ideal for co-cure and secondary composite bonding applications  
- Compatible with most thermoset and thermoplastic composite systems with over 25 years of flight history with approved database |
|                                 | FM® 309-1      | - Suitable for monolithic and honeycomb bonding applications  
- Compatible with 180°C prepregs and adhesives  
- Combination of high Tg, high toughness, and high temperature shear properties, service temperature 180°C dry, 140°C wet |
| **Peel Ply**                    | FM® 3500 EZP   | - Provides consistent and reproducible resin-rich surface for bonding  
- Protects composite surface from contamination prior to final assembly  
- Easy one-piece removal with excellent tack and drape and a 30-day shop-life |
|                                 | FusePly® 100   | - Provides a consistent, predictable, and quantifiable bonding surface  
- Allows for chemically bonded structures in co-bond & secondary bonding processes  
- Compatible with 180°C prepregs & adhesive films |
| **Surfacing Films and Lightning Strike Protection** | SURFACE MASTER® 905 | - Provides high quality smooth surface requiring minimum preparation for painting  
- Co-curable with composite matrix resins at 120°C and 180°C  
- Can be laminated with metal screen to provide lightning strike protection  
- Available in automated tape laying (ATL) configurations |
| **Paste**                       | Aeropaste® 1006| - High strength, high toughness, excellent hot/wet performance with a flexible, low temperature cure cycle  
- Thixotropic, slump resistant, easy to use  
- Designed for out of autoclave structural bonding and rapid assembly applications  
- Service temperature of 120°C dry and 80°C wet |
| **Edge Fill/Potting Compound**  | BR® 623-1      | - Low density and low viscosity enables automation or hand filling of small cell sized honeycomb and compatible with most 120°C and 180°C curing epoxy prepregs  
- Excellent spreadability and extrudability with no slump or resin separation during cure  
- Flame retardant and low smoke toxicity  
- Service temperatures up to 120°C |
| **Core Splice/Foam Adhesive**   | FM® 490A       | - Can be processed at any temperature ranging from 110° to 180°C  
- Radar transparent  
- Used in variety of applications including honeycomb splicing, bonding of inserts or edge members to core, and localized honeycomb core  
- Use temperature ranging from -55°C to 180°C |