

RAMPF – Boards, Liquid Materials, and Engineering Services for Composite Manufacturing

JEC Composite Connect 2021 – High-performance
RAKU[®] TOOL epoxy boards and RAKU[®] epoxy resins /
Customized solutions for aerospace part production

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Page 1 of 4

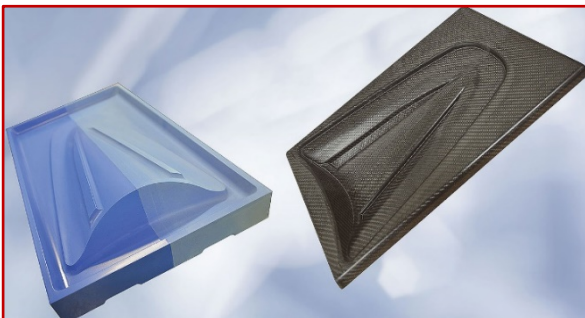
Grafenberg, Germany, May 27, 2021. The international RAMPF Group is featuring high-performance epoxy boards and engineered solutions for aerospace composite part manufacturing at JEC Composite Connect 2021 from June 1 - 2.

Not one, not two, but three leading composite specialists will be present at the digital booth of the international RAMPF Group at JEC Composite Connect, one of top international trade fairs for the composite industry.

1. RAMPF Tooling Solutions offers a comprehensive range of liquid, paste, and board materials specifically designed for modeling and mold engineering. This mainly includes epoxy systems, which cover a wide range of production processes and temperatures, but also epoxy boards.

The highlight at JEC Composite Connect – RAKU[®] TOOL WB-0691, WB-0700, WB-0890, WB-0950 boards for applications in racing, marine, aerospace, and medical technology. These feature

- > Wide temperature application range (HDT 110 - 200 °C)
- > Class A surfaces – reduced finishing effort, less sealer required, high edge strength
- > Fast and easy to process – excellent milling properties, superior chip formation, no sticking, minimal dust
- > Adhesives that match temperature resistance and hardness of boards
- > Compatible with all paints, release agents, and epoxy prepregs in line with current industry standards



RAKU[®] TOOL WB-0890 has an extremely fine surface structure, which significantly reduces both finishing and the amount of sealer that has to be used. The surface finish can be transferred from the master model to the prepreg mold, so that no re-sanding of the mold is required and the service life of the prepreg molds is significantly increased.

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2. RAMPF Group, Inc., the US subsidiary of the international RAMPF Group, has established itself as a leading supplier of RAKU[®] TOOL liquid, paste, and board materials in the NAFTA markets. With its comprehensive range of services, the company also leads the way in terms of technology and quality.

For the composite manufacturing sector on these markets, including special mission aircraft for surveillance, aerial firefighting, and refueling as well as helicopters and urban air mobility, the company has developed a wide range of epoxy systems, including

- > RAKU[®] EI-2508 – the low-viscosity, low-temperature processing, and fast-curing FST system is used for aircraft interiors, rail interiors, and many other applications where flame-retardant properties are required
- > RAKU[®] EI-2510 – the high-temperature, toughened epoxy system exhibits excellent hot-wet properties (dry Tg 210 °C, wet Tg 174 °C), high fracture toughness, and is used for a wide range of structural applications in high-temperature environments; the low-temperature processing 2-component resin requires less investment in tooling and infrastructure and no special storage
- > RAKU[®] EI-2511 – high-performance, flame-retardant structural resin with a high Tg (dry 165 °C, wet 137 °C); the epoxy system fulfills 12 and 60 sec vertical burn and exhibits low viscosity at low processing temperature (200 mPas at 40 °C)

These systems are ideally suited for the early stages of product development or smaller-volume production, as they not only facilitate the cost-effective production of prototypes, but also offer full scalability for higher volume production.



For the manufacture of aerospace composite parts, RAMPF Group, Inc. has developed the cyanate ester infusion system RAKU[®] FST, which is used to manufacture secondary structures in passenger aircraft (e.g. interior parts, doors and cabins, and evacuation system components) as well as seat covers and components in business jets. The low-viscosity infusion system boasts first-class mechanical properties and can be used for applications with FST (fire, smoke, and toxicity) requirements.

3. RAMPF Composite Solutions offers world-class engineering & manufacturing services for the aerospace and medical industries, developing technically advanced solutions from sketch to qualification:

- > Stress analysis and design
- > Part design and engineering

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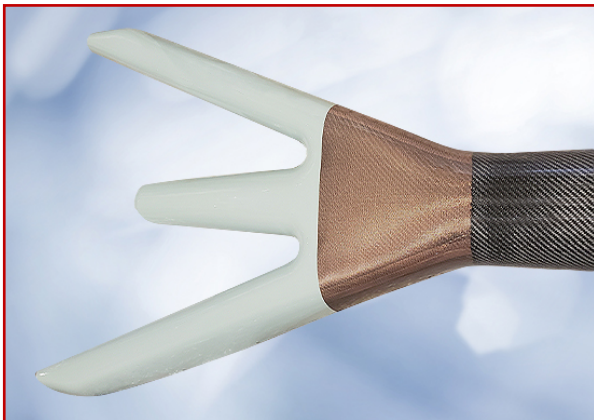
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Page 3 of 4

- > Tooling design and engineering
- > Material and process engineering and development
- > Project engineering and management
- > Manufacturing engineering

At JEC Composite Connect, the company will be exhibiting, amongst others, a main landing gear fairing. The part, designed and manufactured by RAMPF Composite Solutions, replaces aluminum claddings, avoiding problems occurring from natural frequencies as well as significantly improving structural strength and fatigue behavior. Due to the higher design freedom of fiber composites compared to aluminum, aerodynamics are also considerably improved. Furthermore, the number of components was reduced from 16 to 5, which saves the customer additional costs, as the assembly time is significantly reduced.



The main landing gear fairing has to meet the strictest fire protection requirements, as it is close to the engine and has very high operating temperatures. That is why the epoxy resin RAKU[®] EI-2511 was used.

Visit RAMPF at JEC Composite Connect:

<https://www.jeccomposites-connect.events/attend/>

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www.rampf-group.com



The RAMPF Group stands for **engineering and chemical solutions** and caters to the economic and ecological needs of industry.

The range of competencies includes:

- > production and recycling of **materials** for modeling, lightweight construction, bonding, and protection;
- > technical **production systems** for precise, dynamic positioning and automation, as well as technologies for complex composite parts production;
- > comprehensive range of **solutions and services**, particularly for innovative customer-specific requirements.

With this know-how, RAMPF helps its customers to achieve profitable and sustainable growth.

The Group secures its presence on the international markets with more than 900 employees and six core competencies:

- > **RAMPF Machine Systems** based in Wangen (Göppingen), Germany, develops and produces multi-axis positioning and moving systems, trunk machines, and basic machines based on high-precision machine beds and machine bed components made from alternative materials.
- > **RAMPF Production Systems** based in Zimmern o. R., Germany, develops and produces mixing and dispensing systems for bonding, sealing, foaming, and casting a wide variety of materials. The company also offers a wide range of automation skills relating to all aspects of process engineering.
- > **RAMPF Composite Solutions** based in Burlington, Ontario, Canada, is a holistic composites supplier to companies in the aerospace and medical industries. The company offers a complete suite of services including composite part design and engineering, metal-to-composite conversion engineering, and composite manufacturing to very tight tolerances.
- > **RAMPF Eco Solutions** based in Pirmasens, Germany, develops chemical solutions for the manufacture of high-quality alternative polyols from PU and PET waste materials. This expertise is also put to use in the planning and construction of customer-specific facilities for manufacturing polyols.
- > **RAMPF Polymer Solutions** based in Grafenberg, Germany, develops and produces reactive resin systems based on polyurethane, epoxy, and silicone. Its product portfolio includes liquid and thixotropic sealing systems, electro and engineering casting resins, edge and filter casting resins, and adhesives.
- > **RAMPF Tooling Solutions** based in Grafenberg, Germany, develops and produces board and liquid materials for cutting-edge modeling and mold engineering. The range of skills includes made-to-measure services and products such as pastes, large-volume and full-size castings for Close Contour models, and prototyping systems.

RAMPF has subsidiaries in Germany, the U.S., Canada, Japan, and China.

All RAMPF companies are united under a holding company – RAMPF Holding GmbH & Co. KG – based in Grafenberg, Germany.

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