

Metal replacement/Aircraft

Reinforcement for modern commercial aircraft – Structural parts with Fortron® PPS matrix



Photo: Airbus/Peter Danford

Airbus is a leader in the consistent use of composites to replace metal.

Every extra kilo costs an airline about 1000 dollars per aircraft each year. Lighter construction also means lower fuel and operating costs in the Airbus A380 – and more economical operation as a result. That's why composites with a Fortron® PPS matrix play an important role in about 1000 components: they reduce the weight of components by up to 50 percent versus ones made of metal or light metal alloys. Especially in highly stressed structural components – the leading edges of wings, for example, or fuselage stiffeners – Fortron® PPS composites demonstrate their full potential.

Fortron® PPS for lightweight construction

- A wide range of structural components for modern commercial aircraft (e.g. wing edges, struts, ribs, stiffeners, skins, etc.)
- Use of composites with Fortron® PPS matrix
- Reduction of component weight by up to 50 percent versus components made of metal or light metal alloys
- High strength components with inherent flame retardancy

Fortron® PPS meets the requirements for use in interior and exterior applications in aircraft construction

- FAR 25.853 guidelines: Statutory regulations for the aircraft industry governing fire tests and smoke density tests
- ABD0031: Airbus standards incorporating FAR 25.853 together with additional toxicology tests
- High LOI value > 50% (Limiting Oxygen Index = measure of relative flammability)
- Best chemical resistance of all the high-performance thermoplastics



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Fortron® PPS grades for demanding, innovative applications in aircraft construction

Fortron® PPS

Structure

Fortron® PPS is a linear, semi-crystalline polyphenylene sulfide with excellent melt strength. The grades 0214C1, 1140L4 and 1140LO are used in the aircraft industry.

Properties

- Melting temperature 280 °C
- Service temperature up to 240 °C
- Very good chemical and oxidation resistance
- Inherently flame-retardant without additives (UL 94 V-0) and self-extinguishing
- High hardness, rigidity and dimensional stability
- Minimal water absorption
- Good electrical properties
- Outstanding mechanical properties
- Low creep

Processing techniques

Injection molding, extrusion, blow molding, compression molding, thermoforming



Fortron® PPS composites

- + cut costs through weight reduction and fuel savings
- + consist of PPS films and fiber reinforcements
- + are welded in autoclaves:
 - eliminates the need for costly riveting and drilling operations
 - gives components higher strength and longer service life
 - reduces time and cost of production and assembly
- + reduce the number of components versus metal (just two parts instead of five aluminum components in structural design elements)



Photo: Airbus

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