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Product Information

BASF Aerospace Materials

Ultra Lightweight Meal Trolleys with Ultrason®

Components made from BASF's Ultrason E (PESU) and Ultrason P (PPSU) can be utilized to reduce aircraft meal trolley weight by up to 40% and provide additional design freedom.

Ultrason Trolley Features

- Inherent FST behavior
- Superior wear and impact resistance
- Highest continuous use temperatures of amorphous thermoplastics
- Excellent hydrolysis resistance
- Resistance to chemical, fuel, and oil at elevated temperatures
- High mechanical and dimensional stability across a wide range of temperatures
- Outstanding surface quality

Ultrason Trolley Benefits

- Weight savings over traditional metal trolley components
- Long-term durability
- Washable / sterilizable
- Recyclable
- Surface quality providing a finished look
- Foam core requires no edge fill or potting
- Cost and weight savings as opposed to honeycomb cores
- Able to be colored to fit needs

Alternative BASF Trolley Solutions

Ultrason high temperature thermoplastics can be utilized as a metal alternative in many applications such as interior components, overhead bins, and meal trolleys. Components made from BASF's Ultrason provides a 40% reduction in the weight of a typical trolley, which results in a 140 Kg weight savings for an Airbus A321 airplane. Ultrason E foam can be utilized as core material for the vertical wall panels, while Ultrason P is ideal for extruded profiles and door latch housings. Additional BASF products are suitable for aircraft trolley components such as Ultramid®, Ultradur®, Elastollan®, and Elasturan® which are represented below in Table 1.

Table 1. Products for trolley applications

Trolley Component	Ultrason P (PPSU)	Ultramid Polyamide	Ultradur PBT	Elastollan TPU	Elasturan PU	Divinycell® Foam (PESU)
Door Latch	X	X		X		
Caster Wheel & Bracket		X			X	
Tray		X	X			
Body Wall Panels						X
Pedal Mount		X				
Extruded Components	X	X	X	X	X	

For more information on
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Ultrason® E and P

Ultrason E and P are amorphous, high temperature resins based on polyethersulfone (PESU) and polyphenlysulfone (PPSU), respectively. With many desirable properties such as a high stiffness, high mechanical strength, dimensional stability over a wide temperature range, and inherent fire, smoke, and toxicity (FST) behavior, BASF's aerospace thermoplastics are ideal for many trolley constituents. Ultrason resins are an excellent substitute for thermoset resins, non-recyclable duromers, metals, and ceramics. With all common thermoplastic processing methods available, such as injection molding, extrusion, thermoforming, as well as being foamed, Ultrason materials can be made into almost any shape or size to fit the application need.

Ultrason E is foamed and sold commercially by the Diab Group as Divinycell® F. This foam core technology provides all of the benefits of BASF's Ultrason resin in a lightweight alternative to traditional honeycomb technology. Ultrason P 3010, in particular, can be utilized in the exterior components of the trolley such as the door latch housing and extruded profiles due to its outstanding impact and stress cracking behavior. Various physical, mechanical, and thermal properties for Ultrason E and P, and Divinycell F are displayed in Tables 2 and 3, respectively.

Table 2. Ultrason E and P properties

Property	Test Standard	Units	Ultrason E	Ultrason P
Density	ISO 1183	g/cm^2	1.37	1.29
Moisture Absorption	ISO 62-4	%	0.7	0.37
Tensile Modulus	ISO 627-2	MPa	2700	2360
Stress at Yield	ISO 627-2	MPa	90	74
Elongation at Yield	ISO 627-2	%	6.7	7.8
Charpy Notched Impact (23°C)	ISO 179/1eA	KJ/m^2	7.5	65
HDT/B	ISO 75-2	°C	218	214
Tg		°C	228	220

Table 3. Divinycell F mechanical and thermal properties

Property	Test Standard	Unit	F40	F50	F90	F130
Density	ASTM D 1622	Kg/m^3	40	50	90	130
		Lb/ft^3	2.5	3.1	5.6	8.1
Compressive Strength	ASTM D1621	MPA	0.35	0.6	1.2	1.7
		psi	51	87	174	247
Compressive Modulus	ASTM C 365	MPA	9	18	34	60
		psi	1,305	2,610	4,930	8,700
Tensile Strength	ASTM D 1623	MPA	1.5	1.9	2.8	3.3
		psi	218	276	406	476
Shear Strength	ASTM C 273	MPA	0.6	0.8	1.4	1.7
		psi	87	116	203	247
Shear Modulus	ASTM C 273	MPA	8.5	13.5	24.0	30
		psi	1,230	1,930	3,480	4,350
Shear Strain	ASTM C 273	%	80	80	80	70
Thermal Conductivity	ASTM C 177 (23C)	W/m-K	0.0394		0.0372	0.0389
	ASTM C 518 (20C)				0.0359	
Dielectric Constant	ASTM D 2520-A		1.06	1.06	1.13	
Dielectric Loss Tangent	9.375 GHz		0.0011	0.0009	0.0022	

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