

RECYCLED CARBON FIBER REINFORCED COMPOUNDS

IMS Polymers developed carbon fiber reinforced PA6 and PPS compounds with mechanical properties that are stronger, stiffer, and lower weight than compounds that are reinforced with glass fiber.

Benefits of recycled carbon fibers:

- Sustainable
- Low carbon emissions for automotive industry
- Environmentally friendly

Applications:

Aerospace Automotive Consumer Energy Sport Appliances Defence Industry

Recycled carbon fiber reinforced prime PA6 compounds have lower density than glass fiber reinforced compounds. It is possible to provide up to 8-10% weight saving in your applications.

Table 1. Comparison of recycled carbon fiber (CF) reinforced prime PA6 with glass fiber (GF)

	Unit	Standard	M0104051000173V1 InnoMid® PA6, 10CFR, HS, IM, BL	M0104030000050 InnoMid® PA6, 20GF, HS, IM, NL
Specific Gravity	g/cm ³	ISO 1183	1.17	1.26
Tensile Strength	MPa	ISO 527	150	151
Elastic Modulus	MPa	ISO 527	8000	8000
Tensile Elongation at Break	%	ISO 527	3	3
Notched Izod Impact Strength (23°C)	kJ/m ²	ISO 180	5	9
Unnotched Izod Impact Strength (23°C)	kJ/m ²	ISO 180	50	60
Weight Saving	(%)		7.14	

Recycled carbon fiber reinforced prime PPS compounds are developed and the properties are given in Table 2.

Table 2. Comparison of recycled carbon fiber (CF) reinforced prime PPS with glass fiber (GF)

	Unit	Standard	M0109050000990V1 Artificio® PPS, 20CFR, HS, IM, BL	M0109050000991V1 Artificio® PPS, 30CFR, HS, IM, BL	M0109050000992V1 Artificio® PPS, 40CFR, HS, IM, BL	M0109030000774 Artificio® PPS, 30GF, IM, CL, NL	M0109030000194 Artificio® PPS, 40GF, HS, IM, NL
Specific Gravity	g/cm ³	ISO 1183	1.39	1.45	1.48	1.58	1.68
Tensile Strength	MPa	ISO 527	202	220	230	150	140
Elastic Modulus	MPa	ISO 527	19000	25000	31000	12400	11000
Tensile Elongation at Break	%	ISO 527	2	1	0.5	<3	<5
Notched Izod Impact Strength (23°C)	kJ/m ²	ISO 180	8	9	7	6	11
Unnotched Izod Impact Strength (23°C)	kJ/m ²	ISO 180	38	41	45	40	45

Carbon fiber reinforced compounds provide an excellent alternative to aluminum, die cast zinc, and other metals as they can maintain similar properties with 45% to 60% weight reduction. Also recycled carbon fiber reinforced recycle polymer combinations are environmentally friendly solution in the applications.

Table 3. Comparison of recycled carbon fiber (CF) reinforced prime PPS with Aluminum

Description	Product Grade	Specific Gravity	Tensile Strength (Mpa)	Flexural Modulus (Mpa)	Tensile Elongation (%)
Aluminum	6061-T6	2.7	276	68947	17
Artificio® PPS, 40CFR, HS, IM, BL	M0109050000992V1	1.48	230	30000	0.5

Table 4. Comparison of recycled carbon fiber (CF) reinforced recycled PA6 with Aluminum alloy

	Unit	Standard	M0104050000820V1 InnoEnd® PA6, 35CFR, HS, IM, BL	ENAC 46000 (Aluminum alloy for casting)
Specific Gravity	g/cm ³	ISO 1183	1.28	2.75
Tensile Strength	MPa	ISO 527	216	240
Elastic Modulus	MPa	ISO 527	23000	70000
Tensile Elongation at Break	%	ISO 527	1,5	1
Notched Izod Impact Strength (23°C)	kJ/m ²	ISO 180	9	-
Unnotched Izod Impact Strength (23°C)	kJ/m ²	ISO 180	52	-