insight
Polymers & Compounding TECHNICAL BULLETIN

Compounds Developed for FGF and FFF 3D Printing Processes

Insight Polymers is offering a portfolio of materials for 3D printing with both Fused Granulate Fabrication (FGF) and (FFF) Filament Production to meet the property and process requirements of these critical and growing process methods. These products are tailored to meet both physical properties like Tensile Strength, Flex Modulus, Izod Impact Strength in XY, XZ and ZX planes as well as process properties such as CLTE, Lay-flat and Layer-to-Layer Adhesion. With operating temperature ranges from 70°C –240°C, these products should cover most tooling requirements for composite lay-up tools, large autoclavable tools, thermoforming tools and casting patterns. These products form the foundation of our product offering and can be used in FGF printing and or converted into filament for FFF processes.

Insight has the compounding capability and technical knowledge to ensure materials are developed to meet your demanding application requirements in physical properties, appearance, electrical, wear and friction properties and processability in additive manufacturing systems.

If you don't see a product that meets your needs, please reach out and let Insight Polymers identify your application requirements and develop products to meet or exceed those requirements.

Variations of these products can be customized for your specific needs with polymer modification, functional fillers and reinforcements such as CNT's, Graphene and ICP's (inherently conductive polymers). We also offer wear and friction grades with PTFE, PFPE, Molly and other self-lubricating fillers in all thermoplastic materials (except PVC).

PANC-SD **PP ESD**	▪ ESD PP with Insight CNT Technology provide consistent surface and volume resistivity ▪ Improved modulus ane strength vs conductive carbon black grades ▪ Excellent layer to layer adhesion in FGF and FFF processes
TCMF03 **PETG MF**	▪ Similar strength and stiffness to glass reinforced PETG with little to no nozzle wear ▪ Excellent lay-flat in open air and non heated build area systems ▪ Excellent layer to layer adhesion
CBFC02 **PC/PBT CF**	▪ Good for thermoforming tools with HDT requirements up to 140°C ▪ Excellent lay-flat in open air and non heated build area systems ▪ Excellent layer to layer adhesion
NBFC02 **PA 6 Copoly CF**	▪ Carbon fiber reinforced PA 6 Copolymer with excellent thermal performance ▪ Excellent lay-flat in open air and non heated build area systems ▪ Excellent layer to layer adhesion
TAAFG 10 **PET GF**	▪ Excellent stiffness, strength and temperature perfomarnce above 160 °C ▪ Excellent lay-flat in open air and non heated build area systems ▪ Excellent later to layer adhesion
KBIA **PEEK Alloy**	▪ PEEK alloy with excellent printability and layer to layer adhesion ▪ Excellent lay-flat in open air and non heated build area systems ▪ 240°C + continuous use temperature

Product	Description	Tensile Modulus	Tensile Strength	Elongation at Break	Flexural Modulus	Flexural Strength	Izod Impact (Notched)	Izod Impact (No-Notch)	@0.45 Mpa (66 PSI)	@1.8 Mpa (264 PSI)	Density
PANC-SD	PP ESD	1600	41	7	1200	44	48	544	TBD	TBD	0.900
TCMF03	PETG mineral filled	2600	53	25	2000	64	49	1575	66	70	1.270
CBFC02	PC/PBT CF	4500	70	4	3200	83	70	1800	120	86	1.200
NBFC02	PA6 Carbon Fiber	3033	76	4	3600	110	86	NB	TBD	TBD	1.180
TAAFG 10	PET Glass fiber	*13900	*98	*<2	*7800	*128	108	1104	245	230	1.750
KBIA	Peek Alloy	4000	90	40	3800	145	600	NB	230	152	1.290
		Mpa	Mpa	%	Mpa	Mpa	J/m	J/m	°C	°C	gm/cc
		ASTM D 638	ASTM D 638	ASTM D 638	ASTM D 790	ASTM D 790	ASTM D 256	ASTM D 256	ASTM D 648	ASTM D 648	

* Initial test data derived from printed samples. All other samples tested with Injection Molded test specimens.

PRODUCTION

- Masterbatches
- Fully formulated compounds
- Experience with wide range of base resins
- Stabilizers
- Flame retardants
- Reinforcing fibers
- Biomass
- Recycled materials

RESEARCH & DEVELOPMENT

- Product/process development
- Product/process optimization
  - Prototyping
  - Film
  - FDM
- Injection molding
- Grinding
- Sustainability

TESTING

- Rheology
- Thermal properties
- Mechanical (Instron) properties
- Impact properties
- Ash analysis
- Microscopy
- Chemical analysis

Insight Polymers & Compounding LLC · 1917b Brookside Lane · Kingsport, TN 37660
(423) 567-4727 info@insightpolymers.com www.insightpolymers.com

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