

Ecomass Compounds

Nontoxic High Density Thermoplastic Composite Materials for Weighting, Balancing, Radiation Shielding, and Vibration Dampening Applications

Design Guidelines

Ecomass Compounds are composite materials based on multiple thermoplastic base resins and metal powder weighting additives. Injection molding is the most common method for producing parts with Ecomass Compounds, however, some grades can be extruded and compression molded. Injection molding parameters, including processing parameters and drying conditions, are directly related to the base resin used in the specific compound. Ecomass Compounds can be processed on conventional molding and extrusion equipment using conventional tooling and processes.

Ecomass Compound Nomenclature

1700TU96 Natural

The first three or four numerical digits designate the base resin; the next two alpha characters designate the weighting additive, the next two numerical digits designate the percent weighting additive by weight; there can be additional modifiers identifying the addition of impact modifiers; stabilizers, and lubricants; the last component of the nomenclature is the color which can be a natural (no color added) or a specified color.

Ecomass Series	Base Resins
700	ABS
1000	PEBA/PA12 Alloys
1700	PA12
1800	PA6
1900	PA610
2100	PA66
3300	PEEK
3600	HDPE
4100	PPS
4300	PPA
4500	PP
4700	TPU
5000	SIS
5100	SEBS

Ecomass Grade	Weighting Additive	Density (g/cc)
BI	BaSO ₄	1.5 - 2.5
IO	Fe Oxide	2.5 - 3.5
ZN	Fe	2.5 - 4.0
ZC	SS	2.5 - 4.0
CO	Cu	4.0 - 6.0
ZG	SS/W	4.5 - 7.0
ZE	Cu/W	6.0 - 7.5
ZD	W	7.0 - 10.0
TU	W	7.0 - 11.0

BaSO ₄	barium sulfate
Fe	iron
SS	stainless steel
Cu	copper
W	tungsten

Ecomass Compound Technical Data Sheets, Safety Data Sheets, and Process Guides

Technical information for representative grades of Ecomass Compounds can be found on the Products Page at www.ecomass.com.

Ecomass Design Guidelines

1. **Best practices and design principles** - Best practices and design principals used to design all thermoplastic composite parts and tooling used to mold these parts should also be employed when designing parts and tooling for Ecomass Compounds.
2. **Minimize components** – Ecomass Compounds offer a unique opportunity to minimize the number of components across a product line by permitting the part weight to vary without changing the part dimensions. This is possible because the density of Ecomass Compounds can be adjusted to meet the requirements of almost any application. Tooling costs can also be kept to a minimum because parts with the same geometry, but different part weights, can be produced with the same tool.
3. **Use parts across different product lines** – The use of common part geometries across different product lines will reduce manufacturing costs. By selecting appropriate base resins and weighting agents, Ecomass Compounds can provide a wide range of physical properties to meet the needs of almost any weighting, balancing, radiation shielding, or vibration dampening application.
4. **Design for ease of assembly** – Ecomass Compounds can be injection molded into complex shapes that can meet project design requirements and be easily assembled thus reducing costs. Parts can be molded with threaded inserts or can be fitted with Helicoils for attachment to frames or housings. Ecomass parts can be bonded with epoxies or with cyanoacrylate adhesives (surface preparation and primer may be required for maximum bond).
5. **Design with standard thermoplastic injection molding tolerances** – Dimensional tolerances of less than +/- 0.005” per inch should be avoided if possible; otherwise, additional processing, secondary operations, or sorting may be required. A material density tolerance of +/- 0.1 g/cc is standard for Ecomass Compounds.
6. **Design components for certainty** - Components should be designed so they can be assembled only one way. Special geometric features can easily be added to components molded with Ecomass Compounds to achieve certainty in assembly.
7. **Part decoration** – Parts molded with Ecomass Compounds can be painted, powder-coated, electro-plated and PVD-coated. Ecomass Compounds can also be molded on to aluminum badges that have pressure sensitive adhesives.
8. **Prototyping** – Several grades of Ecomass Compounds are available in stock shapes that can be CNC machined to produce parts prior to committing to a final design.

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