

Star T: New specialty compounds with improved thermal conductivity



The market demand for increasingly powerful products creates a cooling problem in many applications. For instance, continued miniaturization of Electronic & Electrical systems has resulted in a dramatic increase in the amount of heat generated that needs to be dissipated in order to maintain application reliability.

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As such, the need for materials providing an optimum level of thermal management is of primary importance in many applications such as E&E systems, LED device, Automotive Under the Hood Automotive Applications, Cooling Systems, Heat Exchangers, Motors, Battery Housing, Heat Exchanger etc...

The use of metal cooling devices for heat dissipation is well known, for instance aluminum or copper heat sinks as well as metal housings are very common in many applications. Metals are often selected owing to their very high intrinsic thermal conductivity vs. plastics but most of the applications do not require such high level of thermal transfer.

Taking into account heat transfer mechanisms, it can be seen that if heat dissipation is controlled by free convection through air, thermally conductive plastics are the preferred choice. In such cases, there are multiple advantages of using plastics vs. metal : lower manufacturing cost , freedom of design, corrosion resistance, weight reduction. Last but not least, electrical conductivity or insulation can be obtained depending on the type of fillers used.

THERMALLY CONDUCTIVE ELECTRICALLY INSULATIVE PLASTICS

Thermally conductive plastics are made by adding specific thermally conductive fillers into polymers via a compounding process. The performance of such compounds is linked to the choice of additives with high intrinsic thermal conductivity.

A good dispersion in the polymer matrix and high loading are needed to obtain the required thermal conductivity.

Eurostar EP has launched a new range of Thermally Conductive, Electrically Insulative Plastics based on Polyamide and specific mineral fillers.



Star T PA6 65E12 and Star T PA6 75E12 are new grades formulated with specific mineral fillers in order to reach optimum Through-Plane (respectively 0.9 & 1.5 W/m.K) and In-Plane (1.4 & 2.3 W/m.K) thermal conductivities.

These polyamide compounds offer the following advantages:

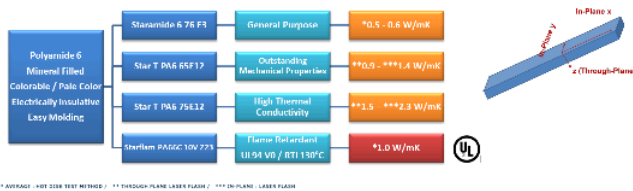
- Best-in class Through-Plane Thermal conductivity (1 to 2 W/m.K);
- Electrical Insulation - Outstanding Mechanical Properties (vs. Boron Nitride);
- Cost Efficient Solution (vs. Boron Nitride);

- Good Processing Behavior;
- Low Abrasiveness (vs. Ceramics such as Aluminum Oxide).

Starflam PA66C10VZ23 is the right choice whenever Flame Retardancy is needed. This grade owns an UL Certification, offering UL94 V0 as well as satisfactory RTI ratings.

Its average thermal conductivity is around 1 W/m.K.

Staramide 6 76E3 is a low cost alternative whenever limited performance is required.



THERMALLY CONDUCTIVE ELECTRICALLY CONDUCTIVE PLASTICS

Eurostar EP has launched a new range of Thermally & Electrically Conductive Plastics based on specific Carbon Mix.

Star T 14009 is high end thermally conductive PP compounds based on an optimized Carbon Fiber/ Mineral Fillers system. This grade offers an high thermal conductivity (InPlane \approx Through Plane : 1.1 \approx 3.1 W/m.K) together with excellent processability . It has a proven capability in Heat Transfer systems.

Staramide 66 2032YE14 and Staramide 66 1032YE14 are PA-66 compounds based on Carbon Fiber mix. Beside optimized thermal conductivity and electrical conductivity, they offer good processability and high mechanical performance level.

Grade	Density g/cm ³	Thermal Conductivity W/m.K	Modulus MPa	Izod Impact kJ/m ²
Star T 14009	1.51	**1.1 **3.1		3 [notched]
Staramide 66 2032YE14	4	**1.2	14000	23
Staramide 66 1032YE14	4.2	**1.2	9100	23

THERMALLY CONDUCTIVE AND ELECTRICALLY ACTIVE POLYAMIDE COMPOUNDS BASED ON METALLIC POWDERS

Eurostar EP broadens its range of Metal Powder Filled Polyamide Compounds. These fillers can be copper, iron or bronze based. They offer solutions whenever high density, freedom of design, thermal conductivity is needed. These grades also show excellent processability enabling molding of complex design.

Some of these grades have been optimized in order to offer high mechanical property profile. For instance Staramide PA6 1565VE10 shows unique combination of rigidity and impact performances.

Grade	Density g/cm ³	*Thermal Conductivity		Modulus MPa	Izod Impact kJ/m ²	Surface Resistivity (Ohm/sq)
		W/m.K	W/m.K			
Staramide PA6 R0E7	3	*0.94		9500	17	$\sim 10^4$
Staramide PA6 R0E10	4	*1.51		5400	25	$\sim 10^9$
Staramide PA12 R5E11	4.2	*1.55		4600	7	$\sim 10^5$
Staramide PA6 1550VE7	2.33	*0.77		11100	28	$\sim 10^7$
Staramide PA6 1565VE10	3.2	*1.1		12800	62	$\sim 10^{11}$
Staramide PA6 1565VE11	3.29	*1		5800	23	$\sim 10^5$

About Eurostar

EP Bringing Solutions to Industry Eurostar Engineering Plastics develops and delivers

engineering thermoplastic resins solutions to serve all market segments. The company recognition comes also from its unique know-how in the development and commercialization of halogen free flame retardant polymers. The company develops specific plastic solutions to meet customer needs while capitalizing on reactivity and flexibility Eurostar-EP products are manufactured in France, in India in China and in the USA.

Per informazioni: [Eurostar Engineering Plastics](#) - distribuito in Italia da [Gazechim Plastics Italia](#)

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