



# POLYETHYLENE TEREPHTHALATE MASTERBATCH WITH GRAPHENE OXIDE (MB-PET/GO)



# DATA SHEET

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### Description

The MB-PET/GO obtained through the extrusion process, from functionalized graphene oxide (Graphenemex®) and polyester resin is part of a new antimicrobial, antistatic nanotechnological additives with extraordinary barrier properties, highly effective and easy to incorporate during PET processing for different applications.

### Features

Its external appearance is of a granulated material for greater ease of dosing and processing. Its black coloration is due to the presence of graphene oxide and does not contain additional dyes.

The incorporation of low percentages of MB-PET/GO during PET processing achieved improvements in the properties of the final product.

Among the benefits it offers are the following:

- Increase in elastic modulus,
- Greater torque capacity,
- Greater resistance to tension, deformation, compression, and impact,
- Resistance to abrasion and wear,
- Increased resistance to UV rays,
- Antimicrobial barrier,
- High chemical resistance.

**Note:** The benefits described are subject to tests carried out by each user and do not depend solely on the use of MB-PET/GO, but on its correct handling, as well as the quality of the raw materials used additionally during the transformation process.

### Use

MB-PET/GO is a material with great opportunities for technological application in the plastics industry and can be used in injection, blowing or extrusion processes for the manufacture of packaging and packaging products, fibers, protection barriers, reinforcement of recycled products based on PET, etc.



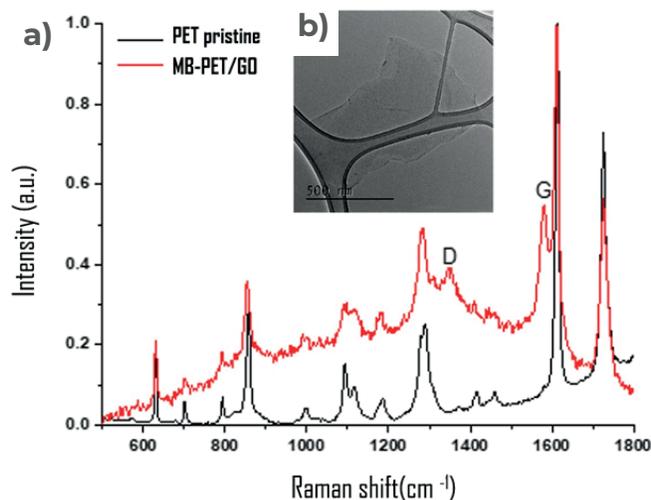
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### Components and properties

Components	CAS No.	EC. No.	%
Isophthalate Terephthalate Polymer with Ethylene Glycol	24938-04-3	607-459-1	≤ 99.0
Graphene oxide	7782-42-5	947-768-1	0.1-5.0
Properties			
Physical state: Solid	Moisture absorption (~23 °C, 50% RH): ~0.23%		
Color: Black	Alkali resistance: Not available		
Odor: Odorless	Solubility: Not soluble in water		
Density: 1.33- 1.40 g/cm <sup>3</sup>	Oxidising properties: Not considered an oxidizing agent		
Melt Flow Rate (MFR): Does not apply	Molecular weight: Not available		
Intrinsic Viscosity: 0.78- 0.82 dl/g	pH: Not available		
Extrusion speed: Not available	Vapor pressure: Does not apply		
Extruder L/D Ratio: Not available	Partition coefficient n-octanol/water: Not available		
Melting temperature: 245- 253°C	Tensile strength (DM): Not available		
Flashpoint: Not available	Tensile strength at yield point: 57 Mpa		
Decomposition temperature: Not available	Breaking strength (DM): 59 Mpa		
Autoignition temperature: >350 °C	Elongation at breaking point (%): 300%		
Flammability (solid): 1	Tensile modulus: 2100 Mpa		
Flexural modulus (1% secant): Not available			

### Characterization



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- a) Raman spectrum of MB-PET/GO (red line), Raman spectrum of PET pristine (black line). The D and G letters correspond to the D band (1350 cm<sup>-1</sup>) and G band (1580 cm<sup>-1</sup>) characteristic of graphenic materials. DXR-Raman-microscope-BR51343 (Energieia fusion S.A. de C.V.),  
b) GO Image by High Resolution Transmission Electron Microscopy. TEM JEOL JEM-2100. Energy Dispersive Spectroscopy (EDX/EDS), Oxford, Instruments. (U.A.S.L.P.).

### Presentation

25 kg bag.



### Material handling

Dry conditions: Before use, MB-PET/GO must be dried at 175°C (350°F) for 3 - 4 hours.  
Dosage: The recommended dose is between 2 and 5% by weight of the pristine or recycled PET polymer matrix, depending on the needs of each product.

### Recommendations

Prior to use, read the product data sheet and safety data sheet.  
The performance of the MB-PET/GO may vary depending on the conditions of each project.  
The MB-PET/GO can slightly dye the final product to a smoky hue. Is advisable to carry out tests during and after the transformation process in order to determine the appropriate dose before full application according to the conditions and characteristics of the final product.  
Like regular PET, MB-PET/GO may also undergo hydrolysis if moisture is not removed before processing by extrusion, injection molding or blow molding. Therefore, for proper handling and prior to melt processing, the moisture content of MB-PET/GO must be reduced to a level of 0.003% or less.  
Mishandling of the moisture content of MB-PET/GO will cause a decrease or loss of its properties.

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### Safety precautions

The product in its current presentation is not classified as dangerous according to the GHS.

Handle in accordance with conventional safety and hygiene practices at work.

Avoid contact with the molten polymer; the use of personal protective equipment such as safety glasses and gloves are safety requirements for personnel who could come into contact with the material during its melting and processing.

Exposure to process vapors can cause irritation to the eyes and respiratory tract.

Do not ingest.

Keep out of reach of children.



WEAR  
PROTECTIVE SUIT



USE GLOVES



WEAR  
GLASSES

### Storage

The MB-PET/GO should be stored in a dry place at room temperature. Like most polymers, MB-PET/GO burns. They are difficult to ignite but are defined as combustible but not highly flammable. Reasonable precautions should be taken to ensure the absence of strong oxidizers and to avoid sources of ignition in warehouses and storage areas. When store large amounts of material, the warehouse must be free of dust, have clear access routes, sprinkler system, etc.

The standards and regulations in force in the place of application in terms of Hygiene, Safety and Environment must be complied.

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### Waste management and environmental impact

The generation of waste should be avoided or minimized wherever may be possible.

**Product:** Disposal of this product and any derivative must comply with the requirements of environmental protection and waste disposal legislation and all local authority requirements. The solid product is treated as waste material and can be disposed of as rubble or recycled.

**Totally empty containers/packaging:** Can be treated as normal waste or recycled.

### Expiration

Shelf life of 5 years in good storage conditions on its original package, indoors, in a cool and dry place, sunlight protected.

### Legal note

The information contained in this data sheet is provided in good faith and is valid only for the product to which reference is made. The information is not intended to be exhaustive, and it is based on Energeia Fusion, S.A. de C.V., current knowledge, and experience, as long as the product is properly stored, handled and applied under normal conditions and in accordance with the recommendations expressed here.

Due to the variability of materials, working conditions and purpose of use, the guarantee is limited solely to the quality of the product supplied. It is advisable to carry out the pertinent tests with the product to determine its suitability before its final application. In case of changes in parameters of application or if it is planned to use for a different application, consult Technical Service. Energeia Fusion, S.A. de C.V., is not responsible for any damage that may be caused by misuse of the product.

For more information contact [contact@graphenemex.com](mailto:contact@graphenemex.com)

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