

# Technical Data Sheet

## PET-G PROGRAFEN GRAPHENE

PET-G PROGRAFEN GRAPHENE: an AGP product, is a thermoplastic polymer that is specifically designed for use in fresh food packaging and food service-ware applications. PET-G PROGRAFEN GRAPHENE is a black general purpose extrusion grade polymer. This is a high molecular weight polymer that processes easily on conventional extrusion equipment. Extruded roll stock is readily thermoformable. See table at right for typical properties.

### Applications

Potential applications for PET-G PROGRAFEN GRAPHENE include:

- Prototype 3D models
- Toys
- Construction elements
- Every-day-use items

### Processing Information

PET-G PROGRAFEN GRAPHENE is easily processed on conventional printing equipment. The material is stable in the filament state, provided that it is being stored in a dry environment

### Process Details

#### Preparation for printing

AGP PET-G Grafen is graphene enhanced PET-G filament, before printing following steps must be taken:

1. **Load filament into extruder head:** Is very important to heat up extruder before printing (optimal extruder temperature are 200-250 °C). When extruder reach set temperature insert filament into the way approved by 3D Printer manufacturer.
2. **Level up printing table and turn up it's heating** (optimal printing table temperatures for PET-G are 55-60 °C)
3. **Upload previously prepared 3D model into 3D Printer controller**
4. **Printing may be started**

### Typical Material & Application Properties <sup>(1)</sup>

Physical Properties	PET-G PROGRAFEN GRAPHENE	Method
Specific Gravity	1.29	D792
MFR, g/10 min (230°C, 2.16kg)	18.2	ISO 1133
Color	Black	
Mechanical Properties		
Tensile Strength, MPa	53	ISO 527
Tensile Modulus, GPa	2.4	ISO 527
Elongation at break, %	4.57	ISO 527
Impact strength, kJ/m <sup>2</sup>	3.73	ISO 179
Suitable for contact with food	YES	

(1) Typical properties; not to be construed as specifications.

### Processing Temperature Profile

Extruder Head Temperature	200-250°C	392-482°F
Printing table Temperature	55-60°C	122-140°F
Printing speed	<100 mm/s	
Post-treatment	Painting, smoothing	
Base	Glass, masking tape	

(1) These are starting points and may need to be optimized.

### Storage

In order to maintain the highest possible quality of the printout, care should be taken to properly protect the filament against moisture. The filament should be stored in a cool, dry and shaded place. In case of problems with too high humidity, drying agents can be used, which should be placed in the filament packaging. The original packaging maintains optimal humidity and temperature of the filament.

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## **Safety and Handling Considerations**

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Safety Data Sheets (SDS) for PET-G PROGRAFEN GRAPHENE are available at <https://prografen.com>. SDS's are provided to help customers satisfy their own handling, safety, and disposal needs, and those that may be required by locally applicable health and safety regulations. SDS's are updated regularly; therefore, please request and review the most current SDS's before handling or using any product.

### **Hazards and Handling Precautions**

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PET-G polymers have a very low degree of toxicity and, under normal conditions of use, should pose no unusual problems from incidental ingestion or eye and skin contact. However, caution is advised when handling, storing, using, or disposing of these resins, and good housekeeping and controlling of dusts are necessary for safe handling of product. Pellets or beads may present a slipping hazard.

No other precautions other than clean, body-covering clothing should be needed for handling PET-G polymers. Use gloves with insulation for thermal protection when exposure to the melt is localized. Workers should be protected from the possibility of contact with molten resin during fabrication.

Handling and fabrication of resins can result in the generation of vapors and dusts that may cause irritation to eyes and the upper respiratory tract. In dusty atmospheres, use an approved dust respirator.

Good general ventilation of the polymer processing area is recommended. At temperatures exceeding the polymer melt temperature (typically 175°C), polymer can release fumes, which may contain fragments of the polymer, creating a potential to irritate eyes and mucous membranes. Good general ventilation should be sufficient for most conditions. Local exhaust ventilation is recommended for melt operations. Use safety glasses (or goggles) to prevent exposure to particles, which could cause mechanical injury to the eye. If vapor exposure causes eye discomfort, improve localized fume exhausting methods or use a full-face respirator.

### **Combustibility**

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PET-G polymers will burn. Clear to white smoke is produced when product burns. Toxic fumes are released under conditions of incomplete combustion. Do not permit dust to accumulate. Dust layers can be ignited by spontaneous combustion or other ignition sources. When suspended in air, dust can pose an explosion hazard.

Firefighters should wear positive-pressure, self-contained breathing apparatuses and full protective equipment. Water or water fog is the preferred extinguishing medium. Foam, alcohol-resistant foam, carbon dioxide or dry chemicals may also be used. Soak thoroughly with water to cool and prevent re-ignition.

## **Disposal**

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DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. For unused or uncontaminated material, the preferred option is to recycle into the process otherwise, send to an incinerator or other thermal destruction device. For used or contaminated material, the disposal options remain the same, although additional evaluation is required. Disposal must be in compliance with Federal, State/Provincial, and local laws and regulations.

## **Environmental Concerns**

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Due to its chemical composition, PET-G does not pose a threat to the environment. Nevertheless, plastics should be disposed of in appropriately labeled containers.

## **Product Stewardship**

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AGP has a fundamental duty to all those that use our products, and for the environment in which we live. This duty is the basis for our Product Stewardship philosophy, by which we assess the health and environmental information on our products and their intended use, and then take appropriate steps to protect the environment and the health of our employees and the public.

## **Customer Notice**

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AGP encourages its customers and potential users of its products to review their applications from the standpoint of human health and environmental quality. To help ensure our products are not used in ways for which they were not intended or tested, our personnel will assist customers in dealing with ecological and product safety considerations. Your sales representative can arrange the proper contacts. AGP literature should be consulted prior to the use of the company's products.

## **PET-G PROGRAFEN GRAPHENE Technical Data Sheet**

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For additional information please contact AGP.

