

#### Product Description

**CLEARTUF® TURBO™ II** Polyester Resin is a TPA-based polyethylene terephthalate copolymer resin specially designed for use in producing bottles for the mineral water market. It is a low molecular weight polymer with a **0.74** intrinsic viscosity (IV).

**CLEARTUF® TURBO™ II** Polyester Resin is designed to provide highly desirable container properties, including clarity, sparkle, and good color. **CLEARTUF® TURBO™ II** Polyester Resin is designed with a special catalyst and stabilizer system that offers property retention during processing. This superior stability also enables use of the required drying conditions without affecting color or molecular weight. **CLEARTUF® TURBO™ II** Polyester Resin also can be processed at lower temperatures compared to other typical bottle grades.

The following table provides the Parameters that characterize the grade. Some Parameters are shown with values that are specified to fall within certain limits. Other Parameters are shown as a single value that we regard as typical of the grade. Minor differences around this typical value will not detract from the performance of the product. All Parameters are measured, under laboratory conditions, by the M&G analytical method shown. Different methods or conditions of analysis may give rise to different values. Purchased material may be accompanied by a Certificate of Analysis or other document, confirming that the product is within specified limits and is consistent with the other values for the stated Parameters.

Parameter	Unit	Value	Limits	Test method
Intrinsic viscosity (IV)	dl/g	0.74	± 0.02	M&G/QC-01
Acetaldehyde content	ppm	1.0	Max	M&G/QC-03
Color (L*-value)	--	70	Min	M&G/QC-02
Color (b*-value)	--	- 1.5	Max	M&G/QC-02
Melting point +	°C	248	± 5	M&G/QC-06
Foreign particles	--	None	--	Visual Detection

+ monitored on feed resin only

#### Regulatory status

**CLEARTUF® TURBO™ II** Polyester Resin is suitable for the manufacture of articles for numerous food packaging applications. Since food packaging regulations differ from country to country, for information about the regulatory status within the United States, Mexico, Europe, or Latin America, please contact your local account manager.

# CLEARTUF® TURBO™ II

Polyethylene Terephthalate (PET)



## Important aspects of use in processing

### Drying

Thermoplastic polyesters such as **CLEARTUF® TURBO™ II** Polyester Resin can undergo hydrolysis if moisture is not eliminated prior to injection molding leading to a decrease in molecular weight and loss in mechanical properties of the bottle, particularly top load performance and impact strength. Moisture content of the resin must be reduced to a level of 0.003% (30ppm) or less, prior to melt processing. Drying is best accomplished in a continuous high heat dehumidifying type air hopper dryer with a regenerative desiccant bed using -40°F (-40°C) dew point air. Typical drying conditions are an air temperature of 350°F (175°C), 4-6 hours residence time and a minimum air flow rate of 1.0 ft<sup>3</sup> per minute per pound of polymer consumed per hour.

### Injection molding and Stretch blow molding

Injection molding temperatures should be maintained at the minimum levels needed to produce clear quality preforms. In addition to temperature limits, care should be taken to avoid excessive shear during injection. Typical processing temperatures are generally between 20°C and 40°C hotter than the Melting Point Parameter indicated on the front of this Data Sheet, largely dependent upon injection barrel dynamics such as residence time and shear. When stretch blow molding, preforms should be heated to minimum levels needed to produce clear, quality biaxially oriented containers. Typical preform surface temperatures are generally between 90°C to 105°C, largely dependent upon the equipment setup and efficiency.

## Safety aspects

Please read the **Safety Data Sheet** written for this product. It may be obtained from your account manager.

- **Handling**  
**CLEARTUF® TURBO™ II** Polyester Resin presents no toxic hazards, either from skin contact or inhalation, under normal conditions. Contact with melted polymer should be avoided. Product delivered in bags must not be stacked.
- **Fire precautions**  
In common with most other organic polymers, PET polymers will burn. They are difficult to ignite, but are defined as 'combustible' but not 'highly inflammable'. Reasonable precautions should be taken to ensure absence of sources of ignition in warehouses and storage areas. If large quantities are stored, normal good housekeeping should be enforced, including freedom from dust, uncluttered access ways, sprinkler system, etc.

## Warranty

All products purchased from or supplied by M&G Polimeros Mexico, S.A. de C.V. and/or Polymers Sales & Logistics, LLC are subject to terms and conditions set out in the contract, order acknowledgment and/or bill of lading. M&G/PSL warrants only that its product will meet those specifications designated as such herein or in other publications. All other information, including that herein, supplied by M&G/PSL is considered accurate but is furnished upon the express condition that the customer shall make its own assessment to determine the product's suitability for a particular purpose. M&G/PSL makes no other warranty either express or implied, regarding such other information, the data upon which the same is based, or the results to be obtained from the use thereof; that any products shall be merchantable or fit for any particular purpose; or that the use of such other information or product will not infringe any patent.

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