



PARALOID EXL™ 2330 (powder)

PARALOID EXL™ 3330 (pellet)

Acrylic Impact Modifier for Polycarbonate, Polyesters, PC/Polyester Blends, GF Nylon, SAN and Epoxy

Description

PARALOID EXL™ 2330/3330 modifier is a general purpose all acrylic core-shell impact modifier providing an excellent balance of impact resistance and modulus retention in a variety of engineering resins. Because of the core-shell structure and acrylic composition, the improvement in impact is obtained with only minor effect on other mechanical properties, such as heat distortion temperature, and with no adverse effect on weatherability.

Improved impact properties can be expected in the following engineering resins: Polycarbonate (PC), Polyesters (PET, PBT, PPT), Polyacetal, Styrene-Acrylonitrile (SAN) and blends of these thermoplastics. Glass fiber reinforced nylon is another resin system where PARALOID EXL 2330/3330 modifier provides improved toughness. When dispersed properly, PARALOID EXL 2330/3330 modifier will also improve impact properties of thermoset resins such as epoxies.

Excellent Dispersion

PARALOID EXL™ 2330/3330 modifier has a crosslinked poly (butyl acrylate) core with a grafted polymethyl methacrylate shell. This core-shell structure allows the product to disperse as discrete particles in the matrix. It will not dissolve in solvents or melt.

Conversion Process

PARALOID EXL™ 2330/3330 modifier finds utility in a variety of conversion processes typically encountered for engineering resins, including extrusion, injection molding, blow molding, and thermoforming.

Performance Benefits

PARALOID EXL™ 2330/330 modifier provides the following benefits:

- High impact strength
- Excellent processability
- Weatherability
- Well defined particle size, not influenced by compounding conditions

PARALOID EXL 2330/3330 modifier is manufactured in facilities with ISO 9002 quality assurance certification.

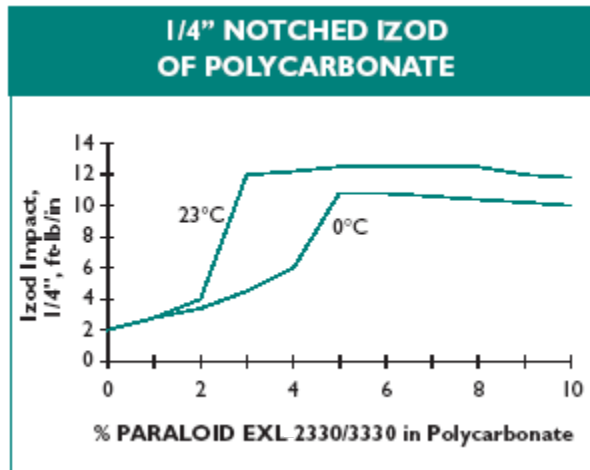
Physical Characteristics

Chemical Description:	Acrylic polymer
Appearance:	PARALOID EXL™ 2330 - free-flowing white powder PARALOID EXL™ 3330 - white pellets
Powder Bulk Density (loose):	0.41-0.57 g/cc
Total Residual Volatiles:	≤1% (powder) ≤0.70% (pellets)
Tg:	≤-43°C

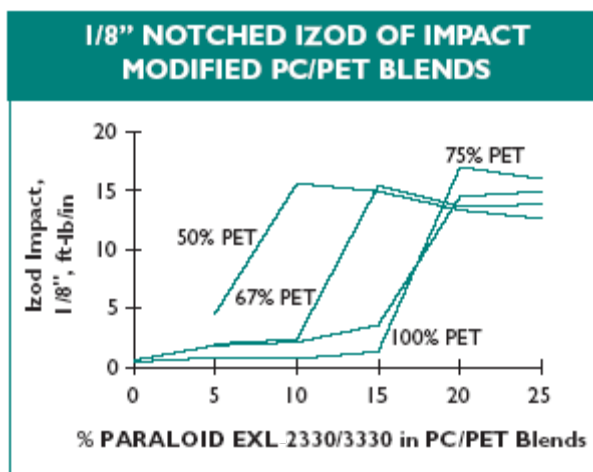
Applications/Uses

PARALOID EXL™ 2330/3330 modifier is especially useful in applications where weatherability is required and low temperature impact strength is not a requirement. The uses include automotive under-the-hood applications, electric and electronic connectors, body panels for lawn mowers and tractors, and thermoset molding compounds and adhesives. PARALOID EXL 2330/3330 modifier can also be used to upgrade the impact performance of recycled resins.

Impact Performance Toughness of Polycarbonate

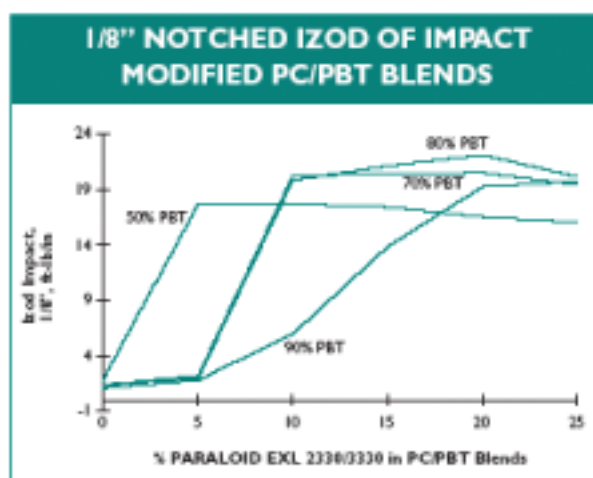


The toughness of polycarbonate even at low temperatures can be significantly improved by the addition of PARALOID EXL™ 2330/3330 modifier. Recommended use level is as low as 3%, depending on temperature requirements.



Toughness of Polycarbonate/PET Blends

While the toughness of PET can be upgraded by modification with PARALOID EXL™ 2330/3330 modifier, better impact resistance can also be attained by blending the polyester with polycarbonate in the presence of PARALOID EXL 2330/3330 modifier. With the increasing availability of mixed streams as recycling efforts increase, this becomes an especially attractive option. These recycle blends can also benefit from the improved toughness provided by PARALOID EXL 2330/3330 modifier. Typical Izod impact values for 1/8" samples are given in the chart above for blends containing different percentages of PET with polycarbonate.



Toughness of Polycarbonate/PBT Blends

The toughness of PC/PBT can also be upgraded by modification with PARALOID EXL™ 2330/3330 modifier at levels depending on the blend ratio with polycarbonate. Typical Izod impact values for 1/8" samples are given in the chart for blends containing different percentages of PBT with polycarbonate.

Recommended Use Levels

The use level will depend on the required performance in a particular matrix. Please refer to the preceding charts for guidance or contact The Dow Chemical Company technical service.

Standard Packaging

For PARALOID EXL™ 2330 modifier, the standard package is either a unitized pallet of 50 x 50 lb. bags (2500 lb. net) or a unitized pallet of 2 x 1000 lb. bags (2000 lb. net). For PARALOID EXL 3330 modifier, the standard packaging is a palletized carton of 1000 lb. net. Please check with your account representative for specific package availability as some packages are dependent upon density and demand of material.

Storage and Handling (see MSDS for details)

Standard recommended storage conditions are as follows:

- Store indoors, protected from weather (moisture)
- Temperature should not exceed 140 deg. F.
- Protected from ultraviolet light
- With stretch hood or stretch wrap intact (if applicable)
- Unopened (if material is opened, should not be left exposed and should be used within one month); ambient temperature preferred.

When stored correctly in the original packaging, the shelf life is:

- 2.5 years from date of manufacture

Safe Handling Information

Avoid high concentrations of dust in air and accumulation of dust on equipment. An airborne dust of this material can create a dust explosion. When handling and processing this material local exhaust ventilation may be required to control dust and reduce exposure to vapors. To prevent dust explosions employ bonding and grounding for operations capable of generating static electricity. Dispose by placing powder or pellets in airtight bags. Incinerate or landfill at a permitted facility in accordance with local, state, and federal regulations.

Material Safety Data Sheets (MSDS)

Material Safety Data Sheets are available outlining hazards and safe handling methods. Contact The Dow Chemical Company for copies of the MSDS for this product and for other handling information.

The Dow Chemical Company Plastics Additives Solutions Provider Product Range

ACRYLIGARD™	Weatherable Acrylic Capstock Resin
ADVALUBE™	Specialty Lubricants
ADVAWAX™	Specialty Waxes
ADVASTAB™	Thermal Stabilizers
ADVAPAK™	Stabilizer/Lubricant One-Packs
PARALOID™	Impact Modifiers
PARALOID	Processing Aids
PARALOID	Acrylic Multi-functionals and Specialties
PARALOID EXL™	Additives for Engineering Resins

The Dow Chemical Company is a raw materials supplier, not an end-use manufacturer of product. Development of a final formulation, testing, application, and ultimate performance of the end-use product is fully the responsibility of the formulator.

These suggestions and data are based on information we believe to be reliable. They are offered in good faith but, as conditions and methods of use of our products are beyond our control, The Dow Chemical Company makes no warranties, either express or implied, concerning the final end-use product. The Dow Chemical Company expressly disclaims any implied warranty of fitness for a particular purpose. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them on a commercial scale.

Suggestions for uses of our product or the inclusion of descriptive material from patents and the citation of specific patents in this publication should not be understood as recommending the use of our products in violation of any patent, or as permission or license to use any patents of the The Dow Chemical Company.

PARALOID, PARALOID EXL, ADVASTAB, ADVAWAX, ADVALUBE, ADVAPAK, and ACRYLIGARD are trademarks of The Dow Chemical Company or of its subsidiaries or affiliates.

Notice: No freedom from any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. **NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.**

