Technical Data Sheet

PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers

Description

PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers are acrylic copolymers with core/shell structure.

Applications

Dow Plastics Additives is a well-known supplier of specialty additives used to improve the characteristics of a variety of engineering resin systems, including polycarbonate, polyesters, polyamides, polyacetal, and polymer blends. PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers are developed for above applications

Regional Product availability

- Asia Pacific

Key attributes

The distinct structure of PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers offer good compatibility with polycarbonates, polyesters, polyamides and their alloys, providing excellent toughness without sacrificing rigidity. The chemical composition based on acrylate derivations and the specially designed formulation gives them excellent weather-resistant and heat-resistant properties.

Thermogravimetric Analysis (TGA) Data of Acrylate Impact Modifiers

	In Air (ºC)		In Nitrogen (ºC)	
Grade	Temperature @ 1% weight loss point	Temperature @ on set point	Temperature @ 1% weight loss point	Temperature @ on set point
PARALOID™ EXL-2311	285	280	301	297
PARALOID™ EXL-2313	281	277	306	303
PARALOID™ EXL-2315	289	304	309	323

Primary Particle Size of Acrylate Impact Modifiers

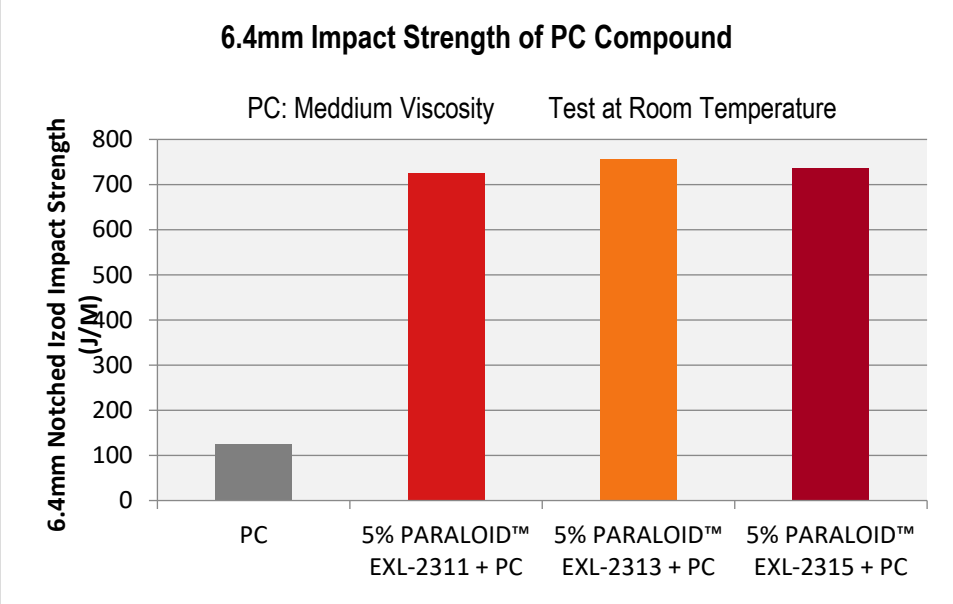
	PARALOID™ EXL-2311	PARALOID™ EXL-2313	PARALOID™ EXL-2315
Particle Size	Medium	Big	Medium

Product Performance

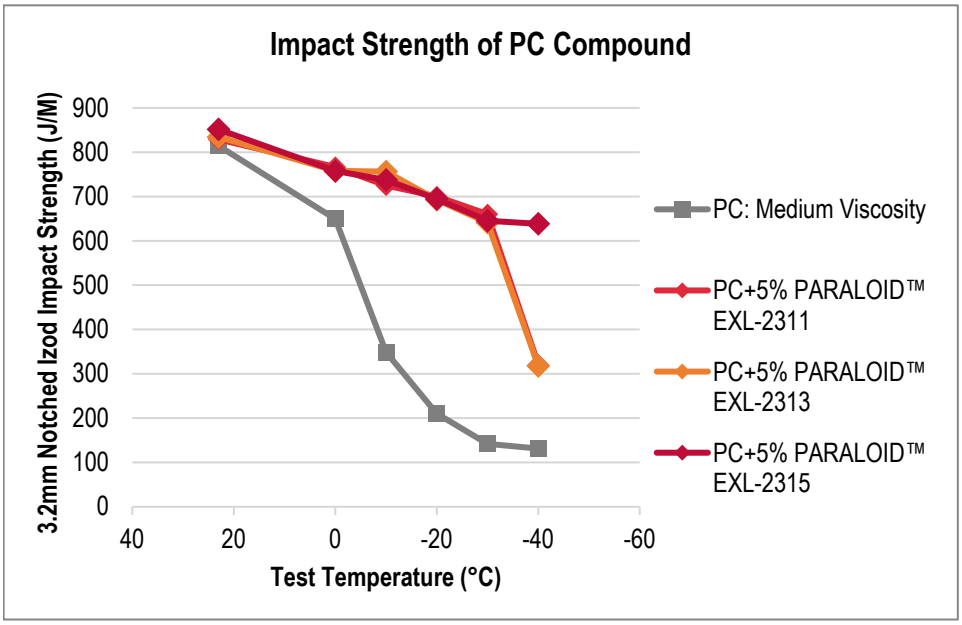
Performance in Polycarbonate

PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers offer excellent impact performance in polycarbonates, which helps polycarbonates to overcome brittleness and notch sensitivity in thick sections.

Product Performance (cont'd)



Adding acrylate impact modifiers can reduce the ductile-brittle transition temperature of polycarbonates. As the graph below shows, PARALOID™ EXL-2315 Impact Modifier has better impact performance at -40ºC with 5% loading level than other acrylate Impact Modifiers.

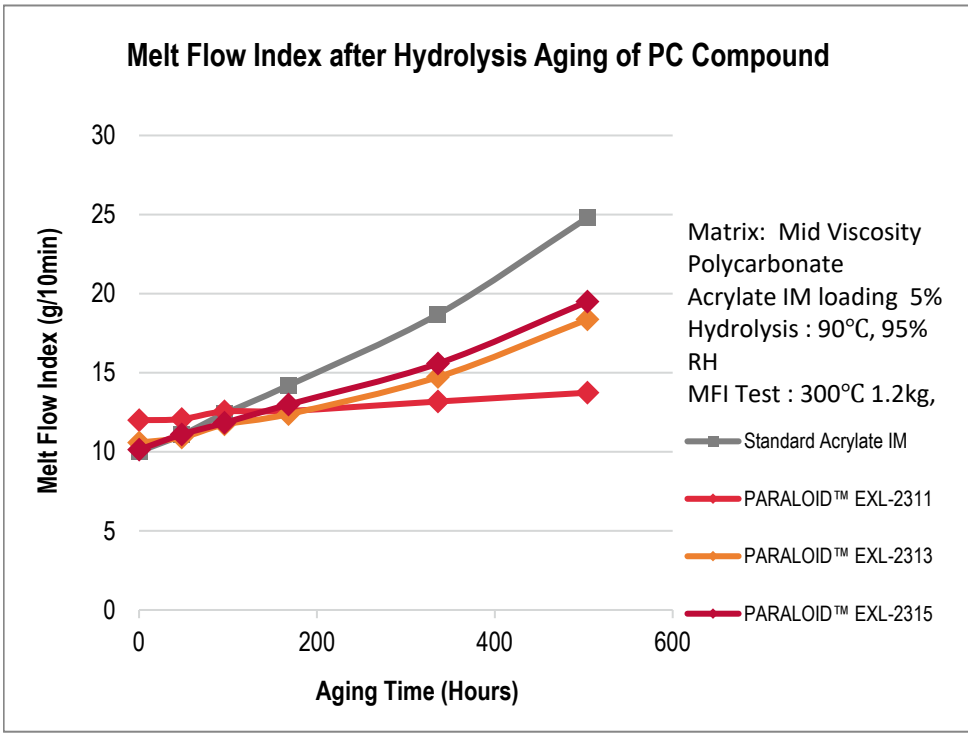


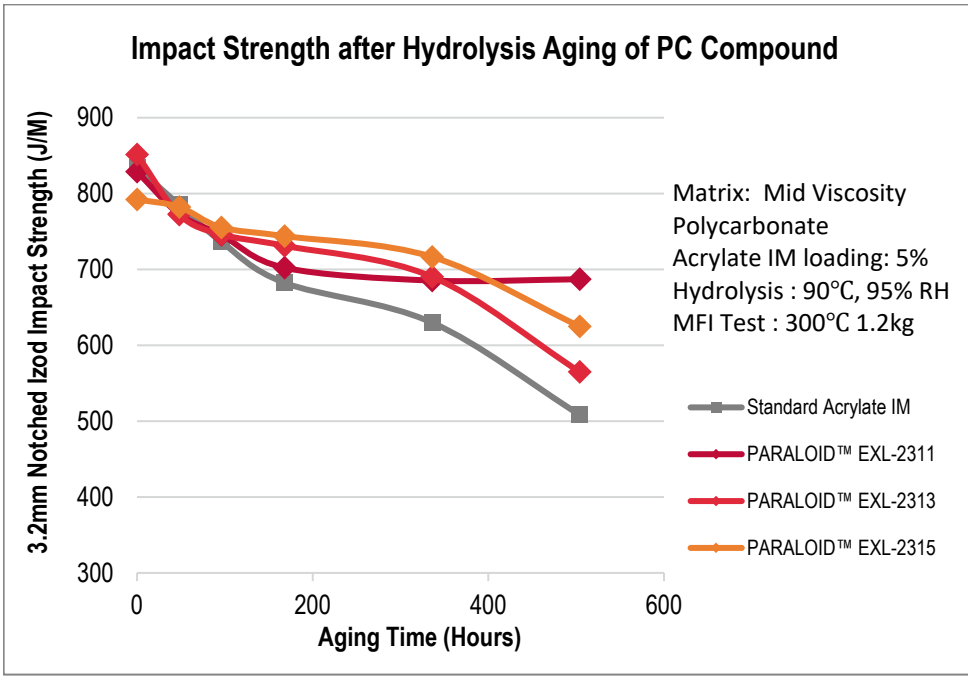
PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers have very good stability against heat and humidity. They are very stable in an oven heating test. PARALOID™ EXL-2311 especially has better performance in a hydrolysis test.

The picture of polycarbonate compound after an oven heating test (ageing temperature is 130°C, 5% impact modifiers in PC).

	0 hrs	48 hrs	96 hrs	168 hrs
EXL-2311				
EXL-2313				
EXL-2315				

Product Performance (cont'd)

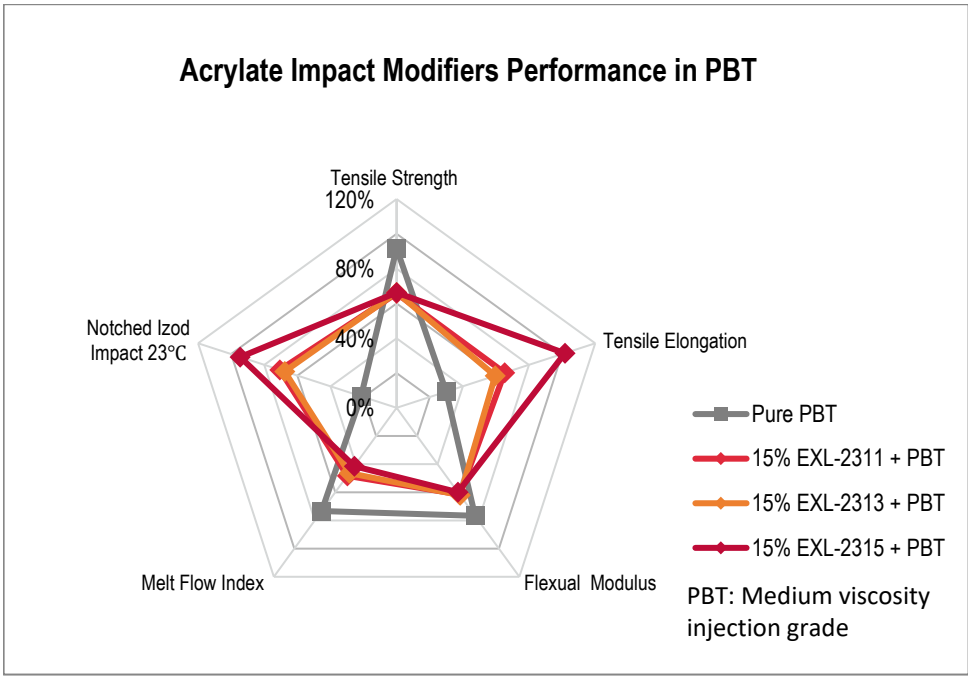


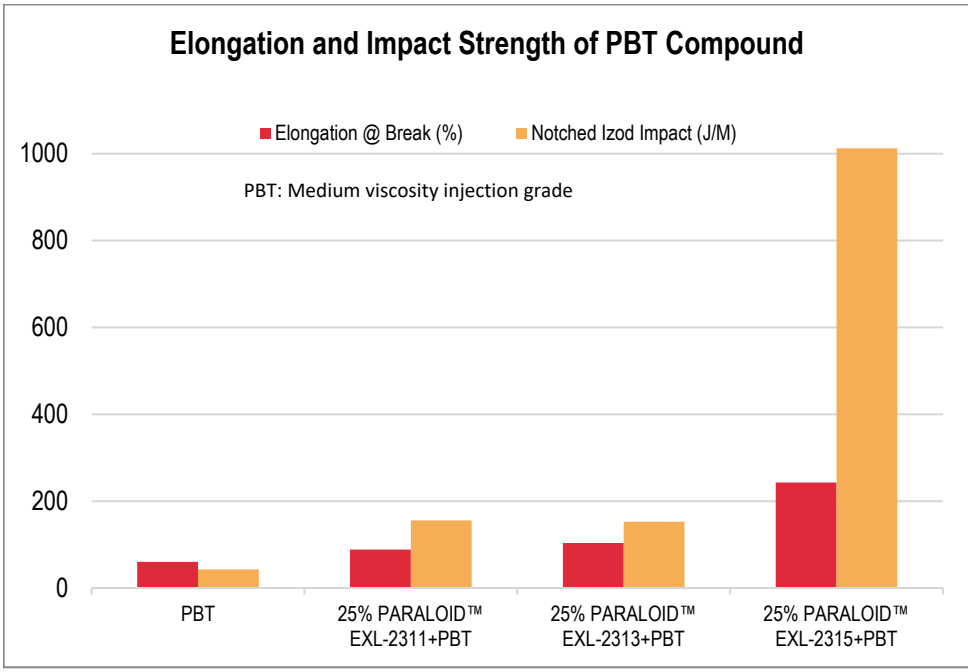


Performance in Polybutylene Terephthalate

PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers are suitable to modify polybutylene terephthalate (PBT). They can improve the impact strength, break elongation, and release mold-in stress. PARALOID™ EXL-2311 has better flow ability in PBT and PARALOID™ EXL-2315 shows better efficiency, especially at high dosage such as 25%, than other acrylate impact modifiers.

Product Performance (cont'd)





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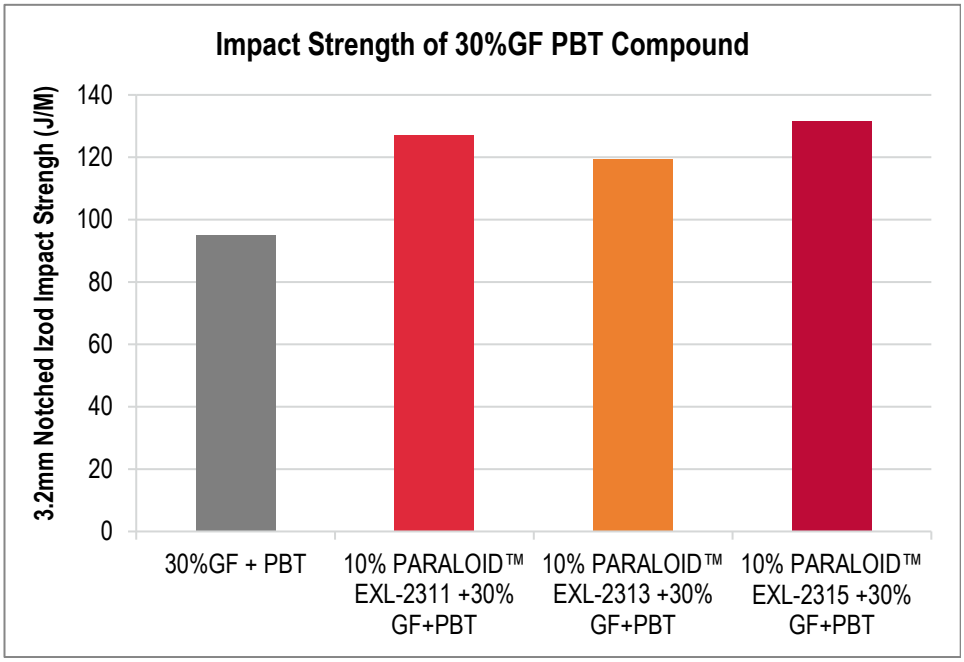
PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers also work in glass fiber reinforced PBT to release stress and improve the impact strength and elongation.

Product Performance (cont'd)



Processing Information

PARALOID™ EXL-2311, EXL-2313, and EXL-2315 Impact Modifiers are easy-flow powder form, which can be handled easily. A twin-screw extruder can disperse them into the plastics matrix.

Product Packaging

The standard package is either a unitized pallet of 20 kg bags or 350-500 kg super sacks/big bags/FIBC bags.

Please consult a Dow representative for specific package availability for this product.

Quality management system

The Dow Chemical Company (Dow) and its subsidiaries have implemented a comprehensive quality management system pursuant to Good Manufacturing Practices (GMP) and various quality management standards including ISO 9001. An overview of **The Dow Quality Management System Manual** can be obtained at the following Internet web site – http://www.dow.com/en-us/about-dow/our-company/beliefs-and-culture/quality-culture. As part of that system, the Dow Plastics Additives business maintain ISO 9001 registration for most of our manufacturing plants. A copy of these certificates available upon request.

Storage and handling precautions

Store unopened in original packaging at ambient temperature. If material is opened, it should not be left exposed and should be used within one month. When stored correctly in the original packaging, the shelf life is 3 years from date of manufacture.

Before using this product, consult the Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage. Contact Dow for copies of the SDS and for more information on this product. Information contained in a TDS document cannot substitute a SDS.

Disposal considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

Medical Applications Restrictions

Dow prohibits sale into certain medical applications. Please check with Dow if you believe your application could be in violation of this policy.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. The customer is solely responsible for determining the suitability of the Dow product for the uses contemplated by customer. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow and available online at www.dow.com.

Regulatory Information

If your application includes a sensitive application such as food contact or drinking water requirements or if you need other regulatory information, please contact your local Dow representative.

Contact information:

If you should have any questions regarding this notice, please contact your local Dow Representative or www.dow.com/contact