



**PARALOID™ EXL 2650A Impact Modifier**  
 For Engineering Resins Applications

Regional Product Availability

- North America
- Europe
- Asia-Pacific

Introduction

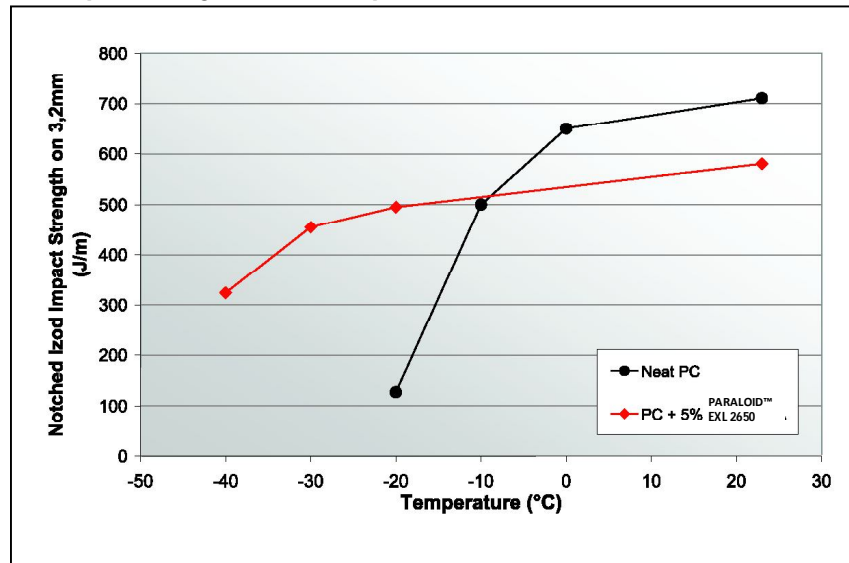
PARALOID™ EXL 2650A Impact Modifier has a core shell structure and is based on butadiene rubber. It has a well defined rubber particle size that is not influenced by compounding conditions.

PARALOID EXL 2650A Impact Modifier demonstrates effective impact modification in various engineering resins such as PC and PBT. PARALOID EXL 2650A Impact Modifier also performs well in PC blends such as PC/PBT and in glass filled systems. The versatility of PARALOID EXL 2650A Impact Modifier allows formulators to tailor blends to help meet specific application needs.

Low Temperature Impact Modification

The low temperature toughness of polycarbonate can be significantly improved with relatively low addition levels of PARALOID™ EXL 2650A Impact Modifier.

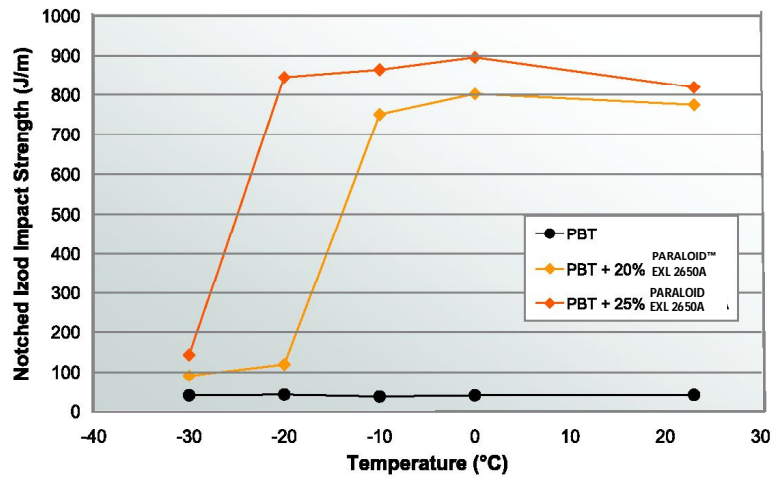
**Izod Impact Strength on 3.2 mm Specimens (PC)**



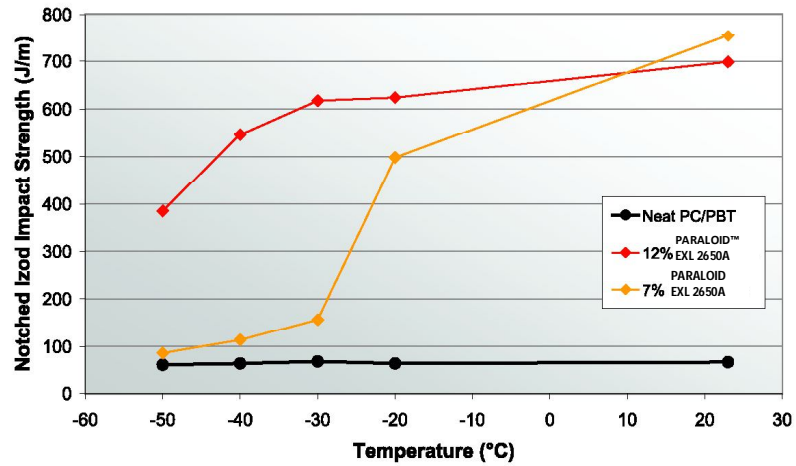
The brittle ductile transition temperature of PBT and PC/PBT blends can be substantially reduced with increasing levels of PARALOID EXL 2650A Impact Modifier, as demonstrated by the following graphs.

Low Temperature  
Impact  
Modification  
(Continued)

Izod Impact Strength PBT



Izod Impact Strength PC/PBT Blend

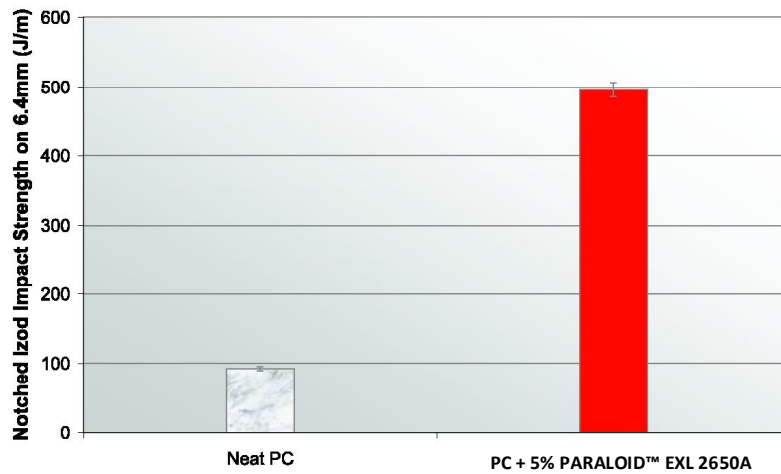


Impact Strength in Thick Sections

PARALOID™ EXL 2650A Impact Modifier is particularly efficient at improving the impact performance in thick section polycarbonate which is normally notch sensitive and brittle.

Performance Enhancement in PC, PC/ABS and Glass Filled Compounds

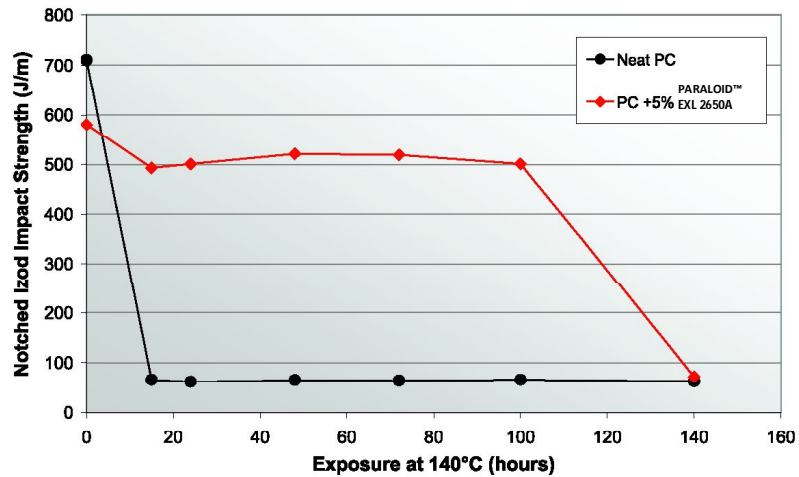
Izod Impact Strength on 6.4 mm Specimens (PC)



Impact Strength after Ageing

By adding PARALOID™ EXL 2650A Impact Modifier to polycarbonate, a significant improvement of the impact resistance after ageing can be obtained. Depending on the polycarbonate grade, an addition of 5–8% leads to ductility after 100–150 hours at 140°C.

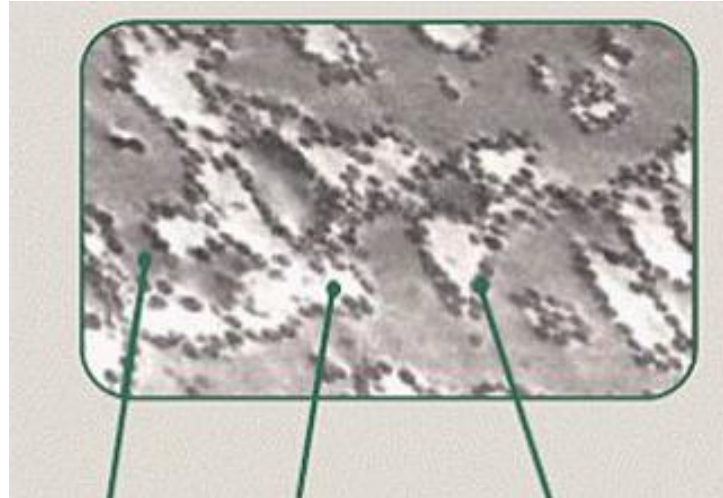
Impact strength of PC after heat exposure at 140°C



Performance Enhancement in PC, PC/ABS and Glass Filled Compounds (Continued)

**Compatibilizing Effect of PARALOID™ EXL 2650A Impact Modifier**

When added to PC/ABS blends PARALOID™ EXL 2650A Impact Modifier acts as a compatibilizer, avoiding phase separation and surface defects. Besides that, the addition of PARALOID EXL 2650A Impact Modifier results in an improved low temperature impact, increased elongation at break and better weld line strength.



PC

SAN

PARALOID™ EXL 2650A Impact Modifier

As can be seen in the above TEM, the core shell particles of PARALOID™ EXL 2650A Impact Modifier position themselves at the interface between the PC and the SAN of the ABS phase and acts as a compatibilizer. This increases the interaction between the phases, leading to a blend with an interesting balance of properties.

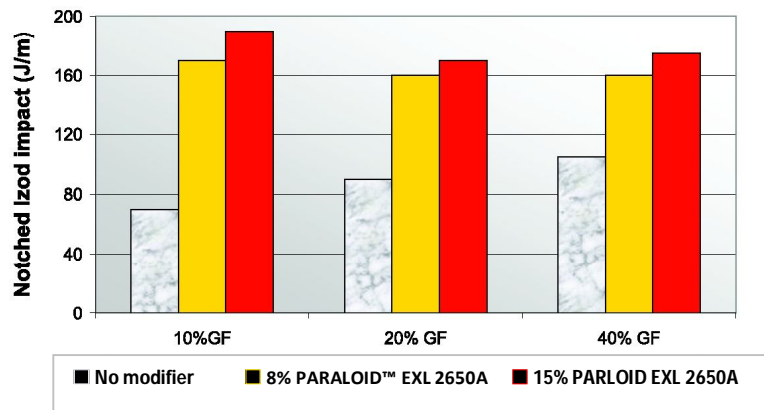
Property	Unmodified PC/ABS	PC/ABS with 6% PARALOID EXL 2650A
<b>Impact strength</b>		
at 23°C (J/m)	450	430
at -10°C (J/m)	150	310
at -20°C (J/m)	145	275
<b>Tensile</b>		
E-modulus (Mpa)	2560	2495
Elongation at break (%)	18	23
<b>Weld strength</b>		
Elongation at break (%)	2.8	11.1
<b>Vicat B (5 kg) (°C)</b>	109.0	107.8
<b>Gloss 60°</b>	91.9	94

**Impact Strength of Glass filled Compounds**

The addition of PARALOID™ EXL 2650A Impact Modifier can help improve the impact of glass filled polycarbonate. This improvement in impact strength is most significant when the level of reinforcing material is in the 10–15 wt% range.

Performance Enhancement in PC, PC/ABS and Glass Filled Compounds (Continued)

**Toughening of Glass filled PC**



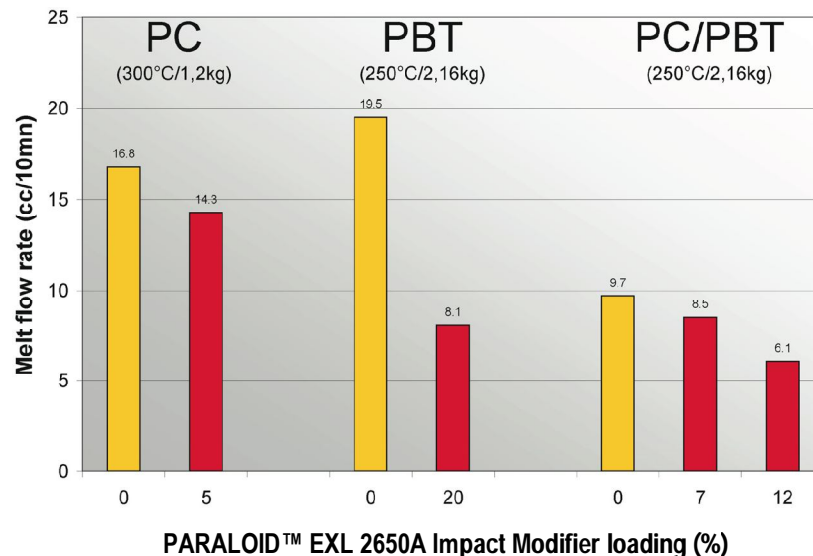
Compounding

PARALOID™ EXL 2650A Impact Modifier is particularly easy to disperse in engineering resins and can be successfully compounded using twin screw extruders. Adequate mixing zones are needed depending on the nature of the blend, more specifically with glass fiber reinforced systems.

Injection Moulding

PARALOID™ EXL 2650A Impact Modifier only slightly influences the rheology of technopolymers. The magnitude of the melt flow reduction depends on the employed impact modifier addition level. Minor modifications have to be made on the injection moulding parameters versus those used for the neat matrices.

**Melt flow index on various impact modified systems with PARALOID™ EXL 2650A Impact Modifier**



Physical Description

Appearance: Free flowing white powder  
 Total residual volatiles: <1%

Handling  
Precautions

Under certain conditions, all organic powders can form explosive mixtures with air. PARALOID™ EXL 2650A Impact Modifier is no different in this respect and has been classified as belonging to the dust explosion class ST1. Risks associated with powders in the class can be mitigated through careful plant design. To ensure safe handling, the appropriate safety regulations should be observed. We recommend that prospective users determine the safe handling procedures necessary for the user's application before manufacturing products. A Material Safety Data Sheet (MSDS), outlining hazards and handling methods, is available from your local Dow sales office.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal

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.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Plastics Additives Technical Representative for more information.

Product  
Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

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