PARALOID™ BLX 3670 Impact Modifier
Impact Modification of Styrenic Copolymers

Regional Product Availability
Europe

Introduction
Dow is a well known supplier of specialty additives used for improving characteristics of a variety of engineering resin systems including polycarbonate, polyesters, polyamides, polyacetal and blends.

- PARALOID™ EXL MBS impact modifiers
- PARALOID EXL acrylic impact modifiers
- PARALOID EXL EOC impact modifiers
- PARALOID EXL specialty modifiers

Styrenic copolymers like ABS, SAN or ASA are found in various applications such as E & E, automotive, leisure or packaging. The styrenic copolymers represent nowadays the largest part in engineering resins, accounting for 40% of the total volume, and experiencing a high growth of around + 5.5% p.a.

Dow has developed an impact modifier, PARALOID BLX 3670, especially designed for styrenic modification. Low addition levels of PARALOID BLX 3670 Impact Modifier improve the impact strength of recycled ABS, mass ABS or blends with PC.

PARALOID™ BLX 3670 Impact Modifier, an MBS Modifier especially designed for Styrenics

Standard core-shell impact modifiers have particle size in the range of 150–250 nm, which is suitable for pseudoctile materials modification.

However, a much larger particle size, from 0.3 to 1.5µ, is needed for the modification of styrenic copolymers.

PARALOID™ BLX 3670 Impact Modifier has large particles, as well as a broad particle size distribution. Both characteristics are needed to achieve excellent impact modification in ABS and SAN.

The addition of PARALOID BLX 3670 improves impact strength at room and low temperatures, without impairing melt flow.
**PARALOID™ BLX 3670 Impact Modifier, an MBS Modifier especially designed for Styrenics (Continued)**

Morphology of Impact Modified SAN with PARALOID™ BLX 3670.

5 microns 1 micron

**PARALOID™ BLX 3670 Impact Modifier in SAN**

Standard MBS were not designed for SAN or ABS and therefore exhibit poor impact performances.

PARALOID™ BLX 3670 Impact Modifier significantly increases the impact performance of SAN, and normally shows better performance standard MBS as well as conventional ABS modifiers.
PARALOID™ BLX 3670 Impact Modifier for Recycled ABS

Low addition levels of PARALOID™ BLX 3670 Impact Modifier used into recycled ABS improves the impact strength significantly. PARALOID BLX 3670 therefore gives ABS sheet extruders the opportunity to:

• either increase recycled ABS ratio in the extruded sheet, saving cost on raw materials
• or use recycled ABS for replacing standard ABS

PARALOID™ BLX 3670 Impact Modifier gives the opportunity to ABS sheet extruders to help save cost by optimizing the use of recycled ABS in their production.

Mass ABS Modification

Mass ABS is mainly used in coloured applications for high quality aesthetic parts because of excellent colour consistency. Although those copolymers exhibit a high impact strength, PARALOID™ BLX 3670 Impact Modifier boosts performance up to 50 kJ/m².
**PC Blends**

PARALOID™ BLX 3670 Impact Modifier also improves the impact performance of PC Blends. In addition, PARALOID BLX 3670 also acts as a compatibilizer in PC Blends, minimizing phase separation when high shear or temperature are used during processing. This leads to better surface aspect, and improved blend properties such as better characteristics retention after ageing or better weld line strength.

![Notched Izod Impact Strength](image)

PC/SAN impact modified with PARALOID™ BLX 3670 Impact Modifier may compete with more costly PC/Mass ABS blends.

**Experimental Data**

**Materials used**

1) Commercial grade of SAN (MVR 220°C/10kg = 22 cc/10mn)
2) Commercial grade of ABS (MVR 220°C/10kg = 4.7 cc/10mn)
3) Commercial grade of PC (MVR 300°C/1.2kg = 12 cc/10mn)

Impact modifier: PARALOID™ BLX 3670.

**Compounding**

Twin screw co-rotative extruder Werner & Pfleider ZSK 30 D=30 mm, L/D=26.
Injection moulding on Arburg press 35T.

Compounds and specimens were produced in Dow Plastics Additives European laboratories.

**Mechanical properties**

Specimens have been tested in compliance with:

- Izod impact ASTM D256
- Charpy impact ISO 179
- MVI ISO 1133
- Colour properties CIE lab 1976

All these tests were performed in Dow Plastics Additives European laboratories. Transmission Electronic Microscopy (TEM) pictures were obtained at Dow Springhouse Research center in the United States.
Handling Precautions

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

**CAUTION!** Keep combustible and/or flammable products and their vapors away from heat, sparks, flames and other sources of ignition including static discharge. Processing or operating at temperatures near or above product flashpoint may pose a fire hazard. Use appropriate grounding and bonding techniques to manage static discharge hazards.

**CAUTION!** Failure to maintain proper volume level when using immersion heaters can expose tank and solution to excessive heat resulting in a possible combustion hazard, particularly when plastic tanks are used.

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

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. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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