



Optical Brightener Replacement in *Pro-fax* PD626

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Background and Objective

- Pro-fax PD626 polypropylene homopolymer contains an optical brightener (OB) additive in order to reduce the yellowness caused by radiation sterilization
- The optical brightener is used at a low ppm level in *Pro-fax* PD626
- Equistar Chemicals' supplier of the optical brightener has obsoleted the additive
- The objective of this study was to validate the performance of an alternative optical brightener in *Pro-fax* PD626

Experimental

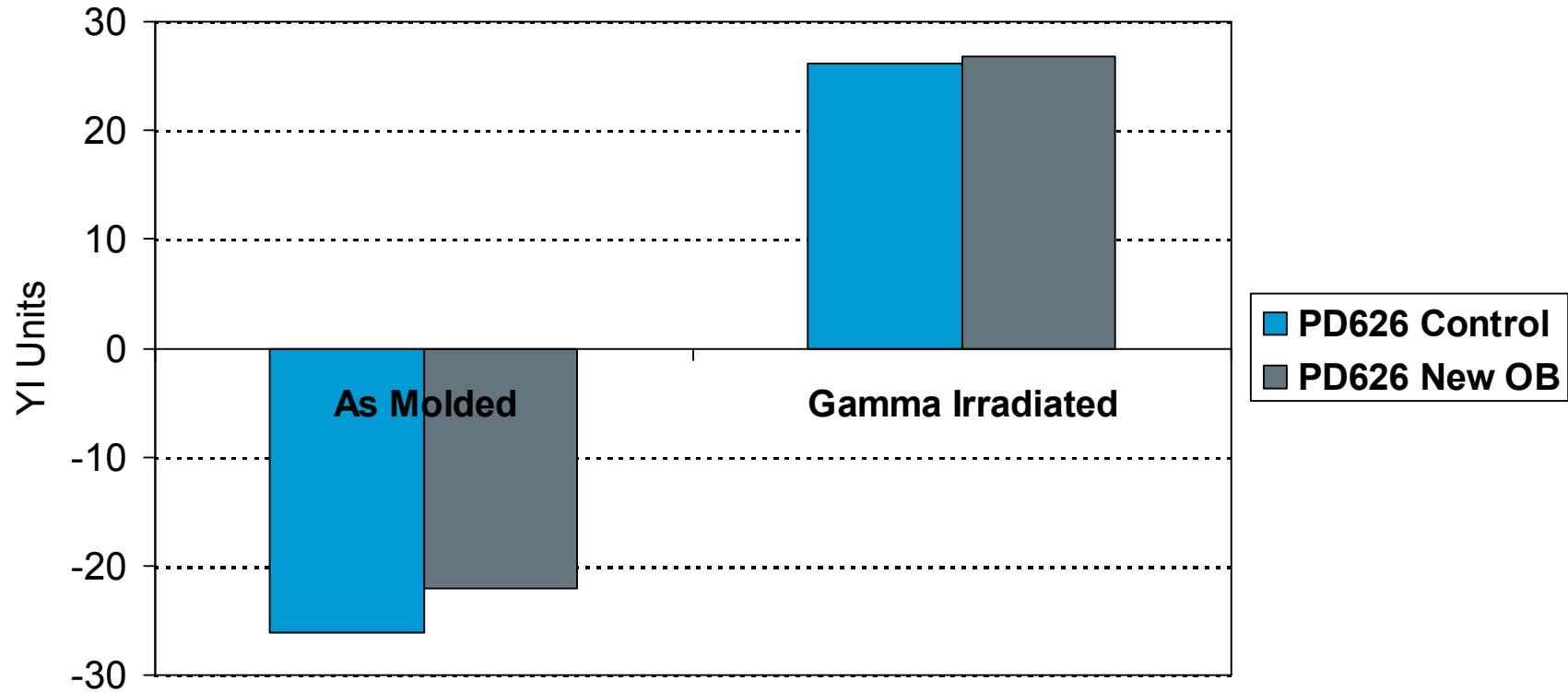
- Samples of *Pro-fax* PD626, with the control and alternative optical brighteners, were produced on a laboratory twin-screw extruder using standard processing conditions
- These samples were designated as “**PD626 Control**” and “**PD626 New OB**” respectively
- The samples were Gamma irradiated at a target dose of 50 kilograys
- The physical and mechanical properties of the samples, before and after irradiation, were tested using standard ISO test methods
- The color change was measured using Yellowness Index (YI) testing

Property Comparison

Property	Method	Units	PD626 Control As Molded	PD626 New OB As Molded	PD626 Control Irradiated	PD626 New OB Irradiated
Melt Flow Rate	ISO 1133	dg/min	10.6	10.1		
Tensile Yield Strength	ISO 527	MPa	36.0	36.2	37.0	37.0
Elongation at Yield	ISO 527	%	10.1	10.0	9.6	9.9
Izod Impact Strength at 23°C	ISO 180	kJ/m ²	4.73	4.86	4.20	4.28

Yellowness Index Comparison

(Negative YI = Less Yellow)



Conclusions

- The overall performance of the new optical brightener is shown to be equivalent to the existing optical brightener in *Pro-fax* PD626
 - ▮ Mechanical properties of *Pro-fax* PD626 with the new OB remain consistent with the control *Pro-fax* PD626
 - ▮ The new OB shows similar effectiveness as the existing OB in controlling the yellowing of *Pro-fax* PD626 post irradiation

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