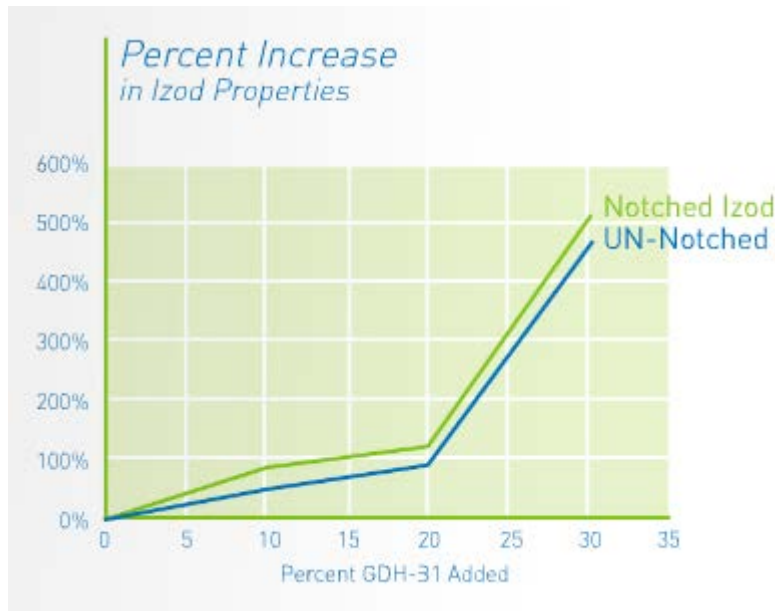


Impact Modification of PLA

Terratek® Flex Enhances Impact Strength and Compostability

Polylactic Acid (PLA) is one of the most widely used compostable bioplastic materials in the U.S. However, the impact strength and heat tolerance of the material is quite low, making it inadequate for more demanding applications. While there are many materials that can be added to PLA to enhance the physical properties, in doing so, most sacrifice compostability. Using Green Dot's Terratek Flex compostable elastomeric bioplastic as an impact modifier for PLA has been shown to increase impact strength and flexibility while enhancing compostability.

Green Dot's Product Development Manager, Mike Parker, studied the use of Terratek Flex as an impact modifier with PLA. PLA was compounded with Terratek Flex at 10%, 20%, and 30%. These samples were sent to an independent laboratory where they were molded and tested using ASTM standards. Notched Izod Pendulum Impact tests showed an incremental increase in impact strength at the 10% and 20% levels with greater increases in impact strength achieved between the 20% and 30% levels. Impact strength increased from 0.549 ftlb/in in the 10% sample to 0.66 ftlb/in in the 20% sample. Impact strength jumped to 1.82 ftlb/in for the 30% loading level. Unnotched Izod tests showed similar results.



Tensile tests showed that strength and modulus properties declined at a proportional rate to be expected with the incorporation of an elastomer with a rigid polymer. Elongation properties showed a similar trend to the results of the impact tests. The 10% and 20% samples showed elongation increased by 4.2% and 9.01% respectively. A more dramatic increase of 18.7% in elongation was observed at the 30% sample.

Mike Parker summarized the results.

“From 0% to 20%, the increase is very linear. After 20%, however, we see a much more exponential increase in the impact strength of both the notched and un-notched test results. Elongation properties have a similar curve. This feature allows the engineer to customize the properties of the final resin to their specifications and provides a certain degree of control to their cost to performance ratio.”

Now, plastics processors can enhance the physical properties of PLA without sacrificing environmental performance, expanding the range of product applications and opening new markets for bioplastics made with PLA. Green Dot’s Product Development Lab can quickly and effectively provide customized formulations designed to exact customer specifications.

If you are currently using Polylactic Acid or seeking new sustainable materials, we can help you make more sustainable products of uncompromising quality.

Want to learn more about creating sustainable plastics? Request a consultation with one of

our sustainability experts today or download our white paper, *Creating Sustainable Plastics Without Sacrificing Quality or Cost*.



Creating a more sustainable plastic

Learn how we're meeting demand for more sustainable goods without sacrificing quality or cost.

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