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Amorphous vs. Semi-Crystalline Polyester

Basically, all polyester produced by DuPont Teijin Films™ (DTF) as well as other PET manufacturers, has a semi-crystalline structure. For trivial sake, the crystalline ratio for DTF polyester is roughly 60% - 40%. Crystallinity refers to the chemical structure of polymer chains. PET manufacturers have the ability to change the degree of crystallinity within a given PET offering. In essence, the higher the level of crystallinity – the higher the films Tg (glass transition temperature).

On a molecular level, a semi-crystalline PET film has a defined molecular “structure” or pattern. This structure results from the biaxial orientation process. The “stretching” orients the molecules, therefore giving the film type its added strength and toughness.

The diagram below illustrates the BOPET process which results in its versatile film characteristics:

On the other hand, PETG is one example of an amorphous film type. The prefix “amorph” literally means “lacking structure”. The extra dose of glycol (G) that is added to the PET polymer package is, in part, what gives PETG its properties (i.e. less strength & lower Tg vs PET). That, and the fact that PETG is an extruded film which does not undergo a subsequent biaxial molecular orientation.

Tekra is a coater, converter and just-in-time supplier of many unique film types. Melinex & Mylar polyester is perhaps the most versatile in our portfolio due to its bi-axial orientation process. To learn more about DTF PET films, and finding a product type fit for your specific application, contact your Tekra representative!

