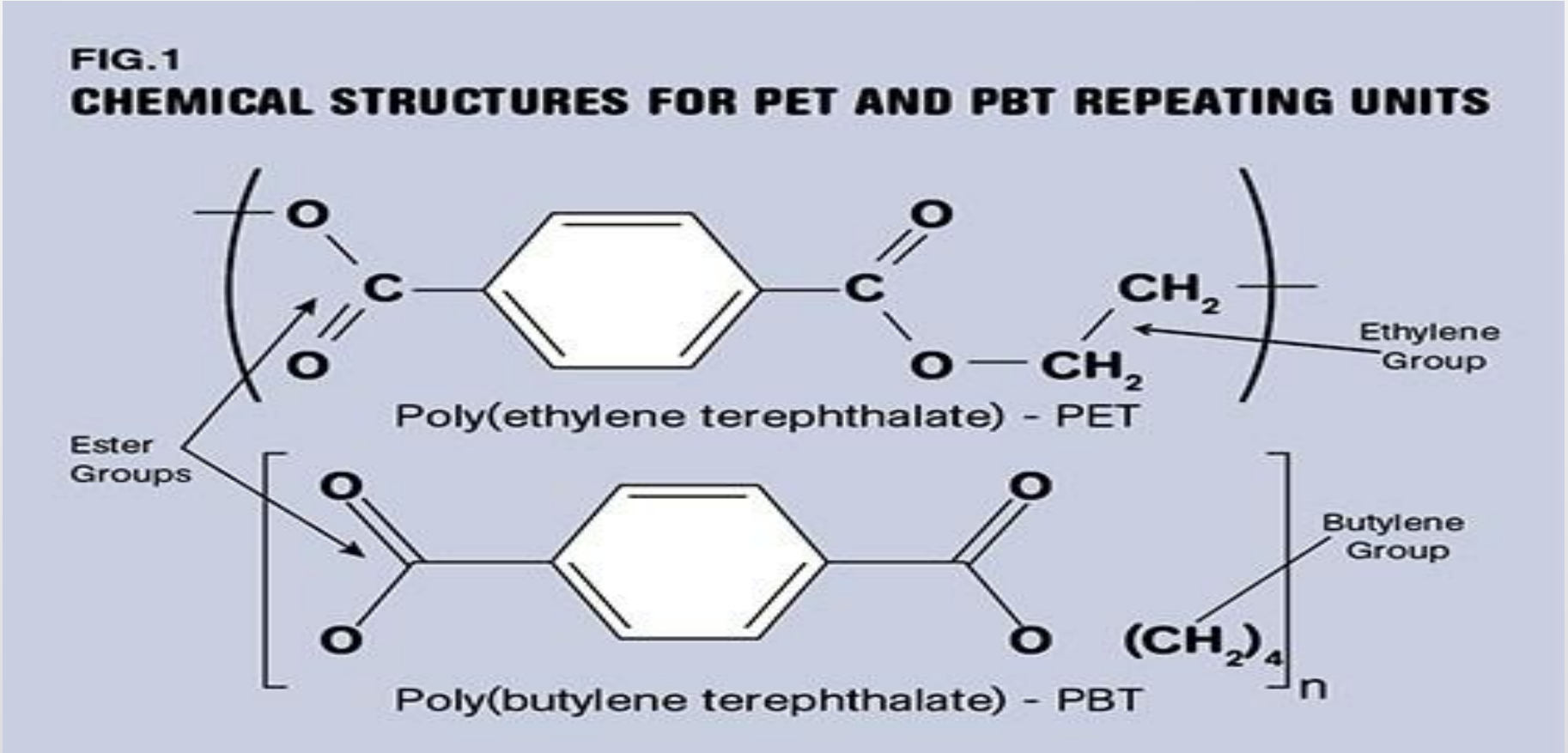
PET/PBT

Performed student group: LP-51(2)

Shelyuk Olexander

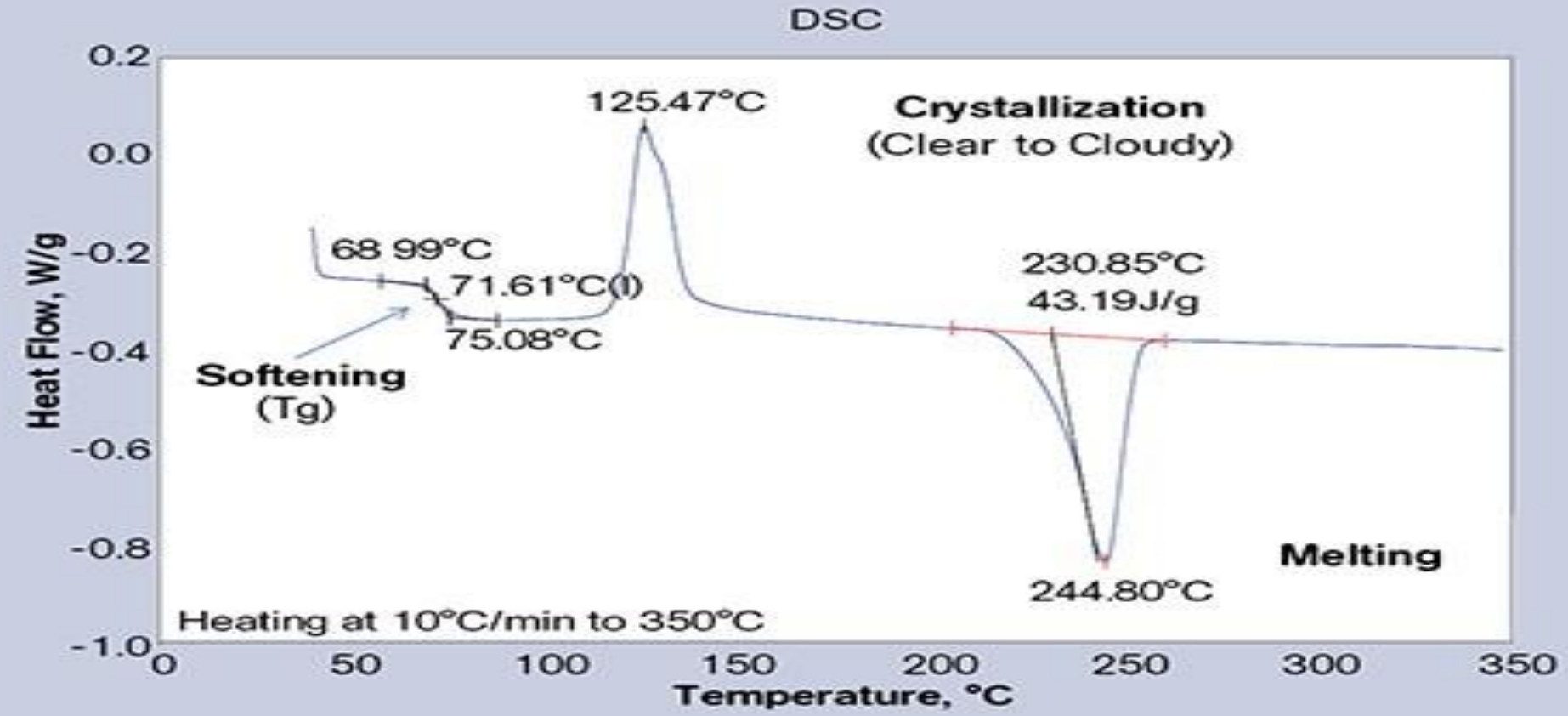
PBT and PET Polyester: Part 1 The Difference Crystallinity Makes



- The differences between PBT and PET are best understood by examining the chemical structure of the repeating unit that makes up the polymer chains. The essential feature that makes the materials distinctive is the terephthalate ester group that lends its name to this family of materials.

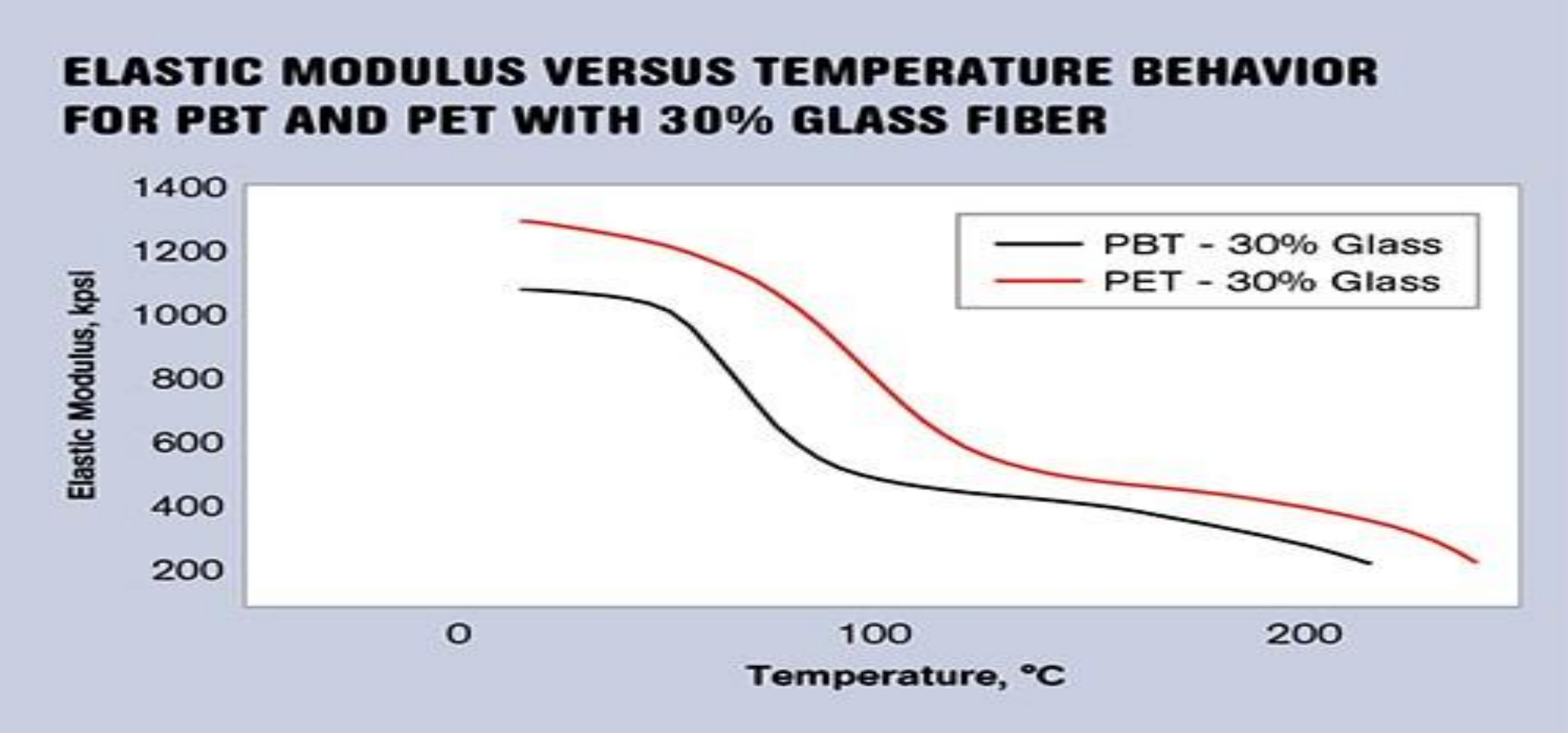
FIG.2

PET'S NARROW TEMPERATURE WINDOW



- If PET preforms get too hot in the preheat cycle, they turn cloudy and brittle with crystallization. The trick is to keep the material above its glass-transition temperature, but below its crystallization temperature. This graph shows that the temperature window may not be very wide.

PBT & PET Polyester: Part 2 The Performance Factor



- PET retains its superior properties across the range from room temperature to the point where the two materials begin to melt. Before melting, both materials undergo a step change in modulus (glass transition) that reduces the stiffness of the materials by a little more than 50%.

MECHANICAL & THERMAL PROPERTIES OF 30% GLASS-REINFORCED PET & PBT

Property	PBT	PET
Tensile Strength, psi (MPa)	17,400 (120)	23,100 (159.3)
Flexural Modulus, kpsi (MPa)	1100 (7590)	1300 (8965)
Glass Transition Temp., F (C)	154 (68)	203 (95)
Melting Point, F (C)	433 (223)	486 (252)

Conclusions

- However, studies have shown that moisture reduction rates in equivalent desiccant dryers are essentially the same and moisture uptake rates after removal from the dryer are similar. The difference is that if you neglect to properly dry PET, the feedback in the form of reduced performance is immediate and often catastrophic. With PBT, the consequences are often not noticeable until things really get out of hand. Therefore, when a processor relates difficulties with brittle PET when it never experienced the same problems with PBT, the material often gets the blame when in reality it is the processor who is responsible.