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Processing Conditions for PET Resin into Bottles

I have a website www.burchamintl.com that contains numerous technical articles related to PET resin. My primary focus is PET sheet, but there are some articles related to your business.

1. Paper #8: The most important aspect of processing PET resin is drying. Paper #8 addresses drying of PET resin.

http://www.burchamintl.com/papers/petpapers/Eastman_8.pdf

One of my PET resin suppliers recommends PET drying: 170-175 °C or 338-347 °F for 5 hours. I have customers who are only drying for 4 hours.

Another PET resin supplier writes: "To process PET, the polymer should be dried to a moisture level below 0.005 % (50 ppm) to obtain optimum properties. Typical drying requirements are a dehumidifying air hopper dryer with regenerative desiccant beds, -20 °C dew point air, 175 °C or 350 °F drying temperature. 4 hours of residence time and minimum air flow rate of 62 litres/minute per kilogram of polymer (1.0 ft³/minute per pound)."

To be safe I would recommend -40 °C dew point air.

2. Paper #8a: The Eastman technical paper addressing injection molding of PET preforms will provide you with the fundamentals of processing PET into preforms.

<http://www.burchamintl.com/papers/petpapers/Eastman%20-%20Injection%20Molding%20PET%20Preforms.pdf>

I find that it is quite interesting that this Eastman article says that "it is not practical to provide optimum barrel temperatures for injection molding PET resin." The only guidance in the article is that you should keep the barrel temperatures at a minimum, but to raise the temperature if haze occurs in the preforms. I have reviewed numerous property data sheets and it seems that none of the producers provide processing temperatures or conditions for PET.

The only guidance that I found on the PET producers's property data sheets was that the processing temperatures should be 10-30 °C above the melting point. The typical melting point for PET copolymers is 242-246 °C, so this would indicate a processing temperature of 255-275 °C.

For PET sheet extrusion a typical rear zone temperature is 300 °C and a typical die temperature of 275 °C. I have some sheet extrusion customer who process as high as

315 °C in the rear zone, and as low as 255 °C at the die. (My customers are PET sheet extruders.)

I wish I could be more definitive in processing conditions, but I hope that this information is still useful for you.

Thank you,

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“Source of PET Resin to the Sheet Industry”