LOTTE
ADVANCED MATERIALS
Processing PC & ABS
Processing Polycarbonate

- Machining
- Extrusion
  - Film
  - Tubing
  - Stock shapes
- Thermoforming
- Injection molding
- Blow molding
Drying Polycarbonate

• Polycarbonate is hydroscopic and needs to be dried before processing
• Drying temperature of 120° C
• Achieve moisture level of less than 0.02%
• Drying time of 4 hours is usually sufficient
• Air dew point should be -20° F or lower
• Extended drying times may cause yellowing of the polymer
Injection Molding Polycarbonate

- Can be processed on most modern injection molding machines
- Can be processed on machines with or without shut-off nozzles
- Press barrel should have a sliding check-ring style non-return valve
- Shrinkage is typically 0.5 to 0.8% uni-directionally
- Draft angles on molds for part de-molding
  - 1°
- Processing temps:
  - 280° C to 320° C
- Mold temperatures
  - 80° to 120° C
- Injection pressure…as high as possible
- Injection speed
  - Slow injection speeds when small or edge gates are used; high speeds for other types of gates
- High processing temperatures and/or excessively long residence time can damage the polymer and lead to a reduction in part performance and/or discoloration
- Adequate exhaust ventilation is recommended
Extruding Polycarbonate

- Can be processed on most extrusion machines
- Use a three zone screw with a 25-30 L/D or a barrier screw
- Compression ratio
  - 2.25:1
- Processing temperatures
  - 270° to 320° C
- High processing temperatures and/or excessively long residence time can damage the polymer and lead to a reduction in part performance and/or discoloration
- Adequate exhaust ventilation is recommended
Drying ABS

• ABS is hydroscopic and needs to be dried before processing
• Drying temperature of 80° C to 90° C
• Achieve moisture level of less than 0.02%
• Drying time of 4 hours is usually sufficient
• Extended drying times may cause yellowing of the polymer in clear ABS
Injection molding ABS

- Shrinkage is typically 0.4 to 0.6%
- Draft angles on molds for part de-molding
  - 1°
- Processing temps:
  - 200° C to 280° C
- Mold temperatures
  - 50° to 60° C
- Injection pressure
  - 70 -140 MPa
- Injection speed
  - Moderate to high
- Screw rpm
  - 50 – 100 rpm
- Back pressure
  - 5 – 15 Mpa
- Adequate venting
Extruding ABS

- Can be processed on most extrusion machines
- Use a three zone screw with a 25-30 L/D or a barrier screw
- Compression ratio
  - 2.75:1
- Processing temperatures
  - 190° to 240° C
- Melt temperature
  - 200° – 245° C
- High processing temperatures and/or excessively long residence time can damage the polymer and lead to a reduction in part performance and/or discoloration
- Adequate exhaust ventilation is recommended
Thank You!