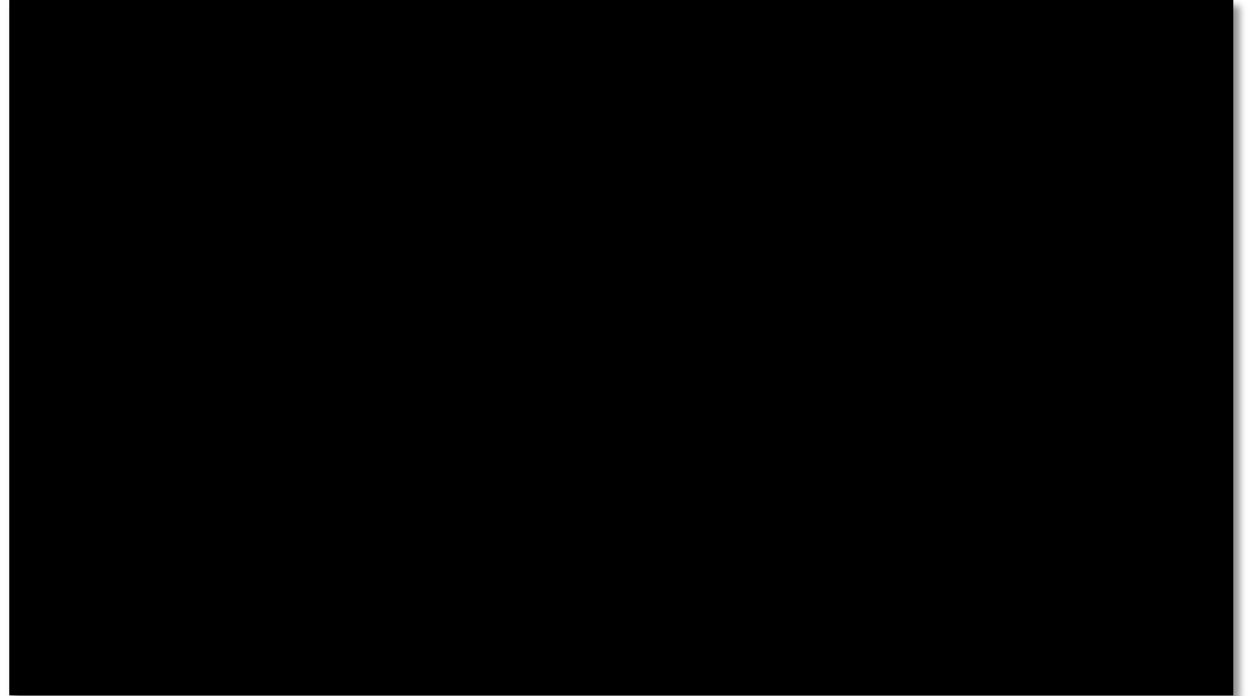
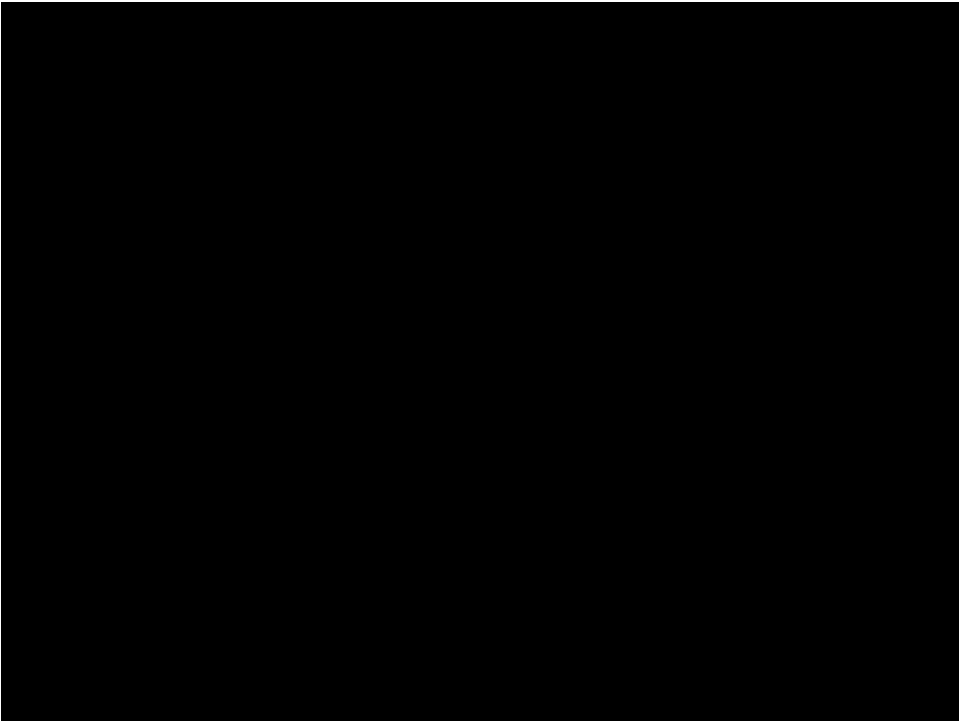


Blow molding

- This process is used in the production of hollow materials such as plastic bottles, drums, and etc.
- In this process, a pre-shaped soft polymer is taken to the mold space, and by blowing (air or nitrogen) it is provided to shape the polymer product, by means of expanding to the inner surface of the mold.
- Basically, the blow molding is performed by extrusion (extrusion blow molding) or injection (injection blow molding).
- Small bottles>>>>> injection blow
- Huge bottles>>>>> extrusion blow

Extrusion blow molding



Injection blow molding



Differences between extrusion and injection blow molding

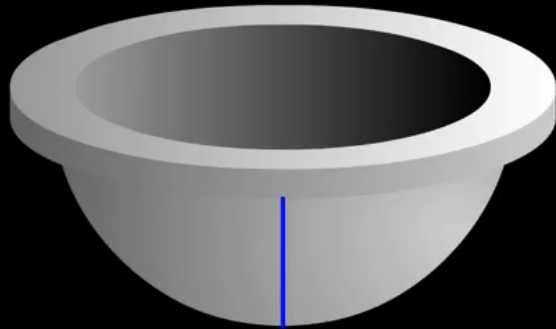
- In the extrusion molding, the parison (soft polymer melt) is directly formed during the process.
- Stable blowing nozzles are used in the extrusion blowing and during the blowing into a parison, the nozzles do not move.
- In the injection molding, a preforming process is applied to the polymer, then this polymer is blow-reshaped after softening. This pre-shaped and molten polymer parts are stored by the pumping into a supercooled mold. Due to the sudden cooling, the polymer is solidified in the form of fully amorphous structure.
- Moving blowing nozzles are used in the injection blowing. During blowing, the nozzles move towards the downside and the soft polymer extends, simultaneously expands with air and forms on the mold.

Homework: Give examples for extrusion and injection molding products (bottles).

Rotational forming



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Rotational Molding 101

Rotational molding uses hollow metal molds of either aluminum or steel. Molds can be cast, machined or fabricated.

- The other method for the production of hollow materials is rotational forming.
- In the process, the mixture of polymer and additive materials (in the form of suspension or powder) are added onto a hollow mold.
- The other hollow mold is sealed onto the filled one. The mold is taken to the oven and heated by continuously rotating. The systems used in the mold rotation can rotate in the two directions that are perpendicular to each other.
- After for a while, the mold is cooled, opened and the product is removed.



Homework:

- Compare three methods for the production of hollow materials...