Method of blow molding a bulk metallic glass

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Description:

A very low pressure gas or blow forming process for shaping a bulk metallic glass (BMG) in its supercooled liquid state that avoids the frictional stick forces experienced by conventional shaping techniques by engineering the expansion of a preshape or parison of BMG material such that substantially all of the lateral strain required to form the final article is accomplished prior to the outer surface of the parison contacting the surface of the shaping apparatus is provided. The capability offered by the inventive shaping process to avoid the frictional forces exerted by the shaping apparatus surface allows for the formation of precision net-shape complex multi-scale parts and components using processing conditions inaccessible by conventional processes. It overcomes the limitations of thinning that limits the strain and thereby the geometry that can be achieved with blow-molding of BMGs.
Fields of Application:

- Laptop and mobile phone casings.
- Complex net-shaped multi scale components: e.g., alloy bottles, fuel containers, medical devices, watch bezels.
- Gemstones setting in BMG.
- Rapid prototyping using molds like plaster or other BMG mold materials.
- Joining of BMG parts to each other or to other materials through complete component net-shaping: e.g., joints, threads, screws.

Stage of Development: Small and large area samples. Casing prototypes.


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