

Processes, systems, and apparatuses are disclosed for forming products from atomized metals and alloys. A stream of molten alloy and/or a series of droplets of molten alloy are produced. The molten alloy is atomized to produce electrically-charged particles of the molten alloy by impinging electrons on the stream of molten alloy and/or the series of droplets of molten alloy. The electrically-charged molten alloy particles are accelerated with at least one of an electrostatic field and an electromagnetic field. The accelerating molten alloy particles are cooled to a temperature that is less than a solidus temperature of the molten alloy particles so that the molten alloy particles solidify while accelerating. The solid alloy particles are impacted onto a substrate and the impacting particles deform and metal-lurgically bond to the substrate to produce a solid alloy preform.