

Materials Designed for Structural Direct Write Additive Manufacturing of Molten Metals

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Technology Summary

Here enclosed are proposed requirements for materials to be compatible with direct write metal manufacturing in ambient atmosphere. Materials exhibit the ability to be drawn into thin beads in free standing space. Furthermore, the proposed materials possess a unique coupling of surface tension and surface chemistry. Current methods for metal additive manufacturing are very expensive for multiple reasons. The material itself can cost over 100 dollars/kg. The high cost makes metal additive manufacturing economically nonviable for most applications. However, if metals could be found which meet necessary criteria for direct write additive manufacturing, metal additive manufacturing could become more widely applicable. Cost for direct write systems are much lower than that of systems such as Selective Laser Sintering and Ebeam, two common methods used in metal additive manufacturing. In addition direct write manufacturing is less time intensive than SLS, and Ebeam. In order for a metal to be compatible with direct write metal additive manufacturing it must meet the three criteria listed below. This invention has the capability to economize the use of metal additive manufacturing.

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