

## The Creep and Fracture Behavior of Additively Manufactured Inconel 625

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**Abstract :** Elevated-temperature creep tests were performed on additively manufactured (AM) Inconel 625 over a relatively wide range of stress. The behavior was compared to conventional wrought alloy. It was found that the steady-state creep rates of the AM alloys were comparable, or even more favorable, than that of the wrought Inconel. However, the ductility of the AM alloy was significantly less than the wrought alloy. The ductility however was recovered with hot isostatic pressing (HIP) of the AM specimens. The basis for the loss and recovery of the ductility will be discussed in terms of the differences in the details of the microstructures. In summary, it appears that HIP AM Inconel 625, over the long-term testing of a year, has very favorable mechanical properties compared to the conventional alloy.

**Keywords :** Inconel, creep, additive, manufacturing

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