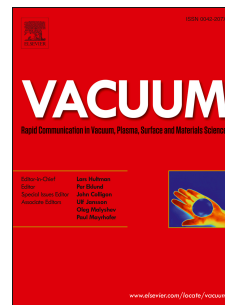


Accepted Manuscript

Direct rapid prototyping of shape memory alloy with linear superelasticity via plasma arc deposition

Bingwen Lu, Xiufang Cui, Xiangru Feng, Meiling Dong, Yang Li, Zhaobing Cai, Haidou Wang, Guo Jin



PII: S0042-207X(18)30885-6

DOI: [10.1016/j.vacuum.2018.08.028](https://doi.org/10.1016/j.vacuum.2018.08.028)

Reference: VAC 8175

To appear in: *Vacuum*

Received Date: 25 May 2018

Revised Date: 13 June 2018

Accepted Date: 16 August 2018

Please cite this article as: Lu B, Cui X, Feng X, Dong M, Li Y, Cai Z, Wang H, Jin G, Direct rapid prototyping of shape memory alloy with linear superelasticity via plasma arc deposition, *Vacuum* (2018), doi: 10.1016/j.vacuum.2018.08.028.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Direct rapid prototyping of shape memory alloy with linear superelasticity via
plasma arc deposition**

Bingwen Lu^{a,b}, Xiufang Cui^{a*}, Xiangru Feng^a, Meiling Dong^a, Yang Li^a, Zhaobing
Cai^a, Haidou Wang^b, Guo Jin^{a*}

^a Institute of Surface/Interface Science and Technology, Key Laboratory of Superlight Material and Surface Technology of Ministry of Education, College of Material Science and Chemical Engineering, Harbin Engineering University, Harbin 150001, China.

^b National Key Laboratory for Remanufacturing, Armored Forces Engineering Institute, Beijing, 100072, China

Abstract

Recently, additive manufacturing (AM) technology has drawn significant attention to fabricate shape memory alloys. In this study, plasma arc deposition (PAD), an AM technology, has been successfully applied to prepare the $Ti_{51}Ni_{49}$ alloy directly and rapidly at the first time. The synthesized PAD $Ti_{51}Ni_{49}$ alloy consisting of TiNi (B2), TiNi (B19') and Ti_2Ni phase, exhibited primary TiNi columnar dendrites structure with a certain number of Ti_2Ni phases distributed in the interdendritic regions. The as-deposited $Ti_{51}Ni_{49}$ alloy displayed a two-step phase transformation evidently (B2 → R → B19') during cooling process, and special linear superelasticity (up to 4.5%) with narrow hysteresis due to Ti_2Ni phase embedded in TiNi matrix phase. This work suggests that the PAD is an effective technology to directly and

* Corresponding author
Email: cuixf721@163.com (X. F. Cui). Email: jinjg721@163.com (G. Jin).

Download English Version:

<https://daneshyari.com/en/article/8943487>

Download Persian Version:

<https://daneshyari.com/article/8943487>

[Daneshyari.com](https://daneshyari.com)