

Author's Accepted Manuscript

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www.elsevier.com/locate/ceri

PII: S0272-8842(18)31882-0
DOI: <https://doi.org/10.1016/j.ceramint.2018.07.153>
Reference: CER118875

To appear in: *Ceramics International*

Received date: 8 June 2018
Revised date: 17 July 2018
Accepted date: 17 July 2018

Cite this article as: Sirisala Mamatha, Papiya Biswas, Pandu Ramavath, Dibakar Das and Roy Johnson, 3D Printing of Complex Shaped Alumina Parts, *Ceramics International*, <https://doi.org/10.1016/j.ceramint.2018.07.153>

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3D Printing of Complex Shaped Alumina Parts

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Abstract

Alpha-alumina powder was mixed with methyl cellulose as a binder with concentration as low as 0.25% by weight in an aqueous medium and kneaded in a high shear mixer to obtain a printable paste. The paste was subjected to rheological measurements and exhibited a shear rate exponent of 0.54 signifying the shear thinning behavior. The paste was used for printing parts with various shapes according to CAD model by employing a ram type 3D printer. Printed parts were dried and the green density was determined. Further, the parts were also subjected to X-ray radiography in order to evaluate the possible occurrence of printing defects. The samples were sintered

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