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Oxidation of a dual phase steel during rapid alloy prototyping

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ABSTRACT:
The growth of oxide scale during high temperature processing routes has a large influence on the surface quality of steels and can result in large quantities of metal loss during steelmaking. Recently, research focussed on rapid product development has resulted in the simulation of the integrated steelmaking route, allowing representative steel samples to be generated and processed on a laboratory-scale. This study explores the effects of oxidation behaviour on a dual phase steel, DP800, using small-scale samples produced through Rapid Alloy Prototyping (RAP). In terms of oxidation, the limitations and opportunities of RAP are not yet fully understood. Experimental interrupted oxidation investigations have been conducted on both RAP and plant-generated samples to understand the scale growth evolution in DP800, with the intention of determining whether the laboratory route is comparable and representative of processes taking place on an industrial scale, and to determine if RAP is suitable for oxidation studies.