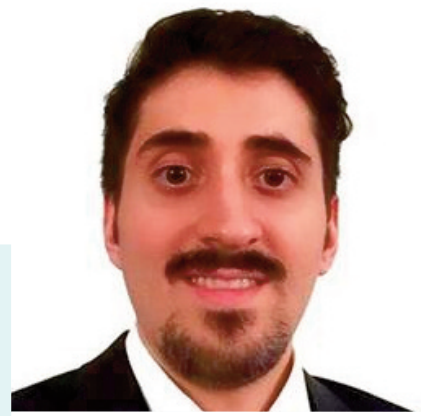




Speaker 7



Pedram Dastur

## *Intercritical annealing optimisation in a segregation neutralised dual-phase steel, benchmarked against a commercial DP800*

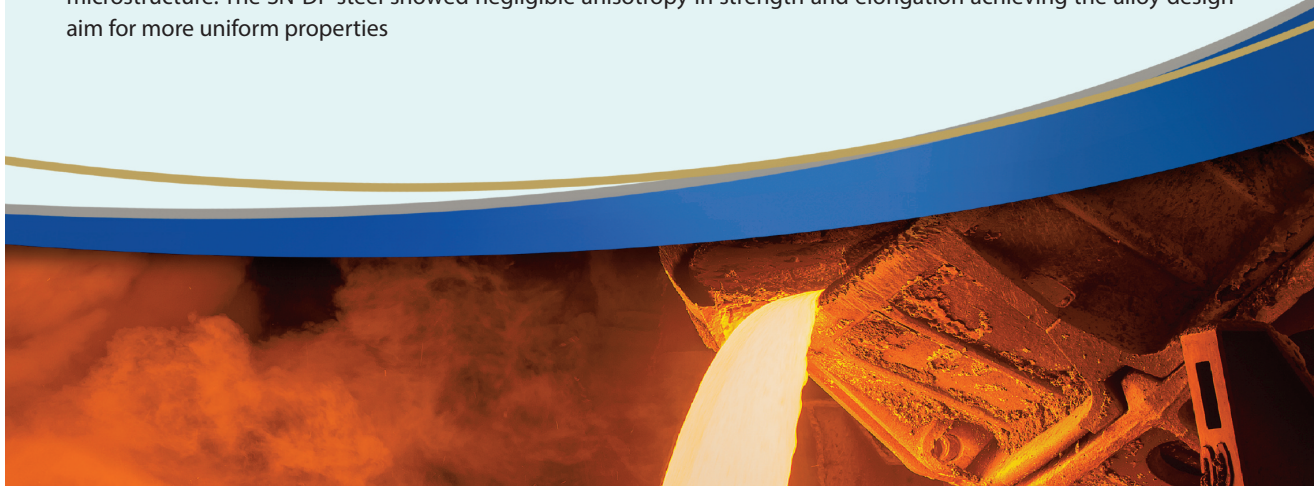
**AUTHOR OF POSTER:**  
Pedram Dastur

**INSTITUTION:**  
University of Warwick

**OTHER AUTHORS:**  
Dr Carl Slater, University of Warwick  
Bharath Bandi, University of Warwick  
Professor Claire Davis, University of Warwick

### **ABSTRACT:**

Dual phase (DP) steels are typified by their ferrite and martensite microstructure, where the martensite is banded in the rolling direction due to micro-segregation of Mn during solidification. The banding results in anisotropy in mechanical properties, and reduced ductility in DP steels. The concept of neutralizing the effect of Mn segregation on the second phase distribution has been employed to remove the banded martensite distribution. To achieve this the steel composition has been redesigned to balance the austenite (Mn) and ferrite (Si) stabilising elements in micro-segregation to introduce a new grade of DP steel named as 'segregation-neutralised (SN)' DP steel. In this report a systematic approach has been used to compare the inter-critical annealing parameters required for the SN-DP compared to a commercial DP steel and the sensitivity of the microstructure to variations in these parameters. The tensile properties, and anisotropy in properties, of the two grades have been compared. It has been found that the commercial DP grade showed higher sensitivity to heating rate in terms of volume fraction of martensite formed compared to the SN-DP steel. However, the SN-DP steel was more sensitive to cooling rate to achieve the desirable ferritic-martensitic microstructure. The SN-DP steel showed negligible anisotropy in strength and elongation achieving the alloy design aim for more uniform properties



Organised by:



**I.M3**

