

Effect of ausforming temperature on the anisotropy of the bainitic transformation in medium carbon steels: a crystallographic study

B1. Advanced Steels

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Introduction/Purpose: Ausforming has been found to be an alternative to the common isothermal treatment which allows to obtain nanobainite. By deforming austenite right before bainitic transformation takes place, austenite strength increases, leading thus to more refined microstructures. However, the anisotropy introduced by deformation has been found to play an important role on bainite transformation. The dilatometric signal during the isothermal step can be significantly altered and the ferrite plates have been found to be highly ordered in some cases. This phenomenon has been associated with the selection of crystallographic variants during the transformation, although a deeper study is still necessary.

Methods: In this study, three different ausforming treatments have been performed, some of them have presented the previously mentioned phenomenon.

Results: Crystallographic analyses have been performed in all cases by means of EBSD and XRD, identifying the reason why such anisotropy effects are only present in some of the cases.

Conclusions: In this poster, those analyses will be shown as a function of the deformation temperature, allowing to see what the differences among the microstructures in terms of crystallography are.