Efficient - Sustainable - Economical

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MOLYBDENUM ALLOYED QUENCHING AND PARTITIONING STEELS

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Quenching and Partitioning (Q&P) steels have seen substantial development and implementation in a variety of product groups. The microstructure of these steels consists of a martensitic matrix with film like retained austenite and is obtained by quenching from the austenitic phase field or from the intercritical region to a temperature intermediate between the martensite start and finish temperatures, followed by partitioning through extended holding at this temperature or holding at a higher temperature followed by final quenching to room temperature. Carbon depletion of martensite and enrichment of austenite is obtained during the partitioning treatment resulting in austenite retention in the final microstructure following room temperature quenching. Austenite decomposition may occur during the quenching from high temperature if insufficient hardenability is provided by the steel chemistry, during partitioning if carbon enrichment does not occur in time, and during final quenching if insufficient carbon enrichment occurred. The present contribution will investigate the effect of molybdenum alloying on the Q&P heat treating response. Molybdenum alloying of CMnSi steels has been shown to increase austenite retention levels and enhance strength/ductility combinations, and molybdenum alloying may prove effective towards Q&P implementation of aluminum containing steels. Perspectives on the role of Mo in Q&P sheet steels during galvannealing will be given.

Speaker Country

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