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# The role of molybdenum on microstructure evolution in low-carbon steels

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This paper provides on overview of the fundamentals of molybdenum alloying on microstructure evolution in low-carbon steels. In particular, austenite grain growth and austenite decomposition will be analyzed in state-of-the-art line pipe and automotive steel grades that benefit from Mo alloying. Both experimental data as well as atomistically informed microstructure simulations will be discussed. In terms of austenite grain growth selected microalloying elements, e.g. Nb and Ti, may play a more dominant role than Mo in limiting austenite grain growth. This theoretically predicted phenomenon is verified with a systematic experimental study using laser ultrasonics to record grain growth in line pipe steels with different Mo alloying. Further, continuous cooling austenite decomposition tests in both automotive and line pipe grades confirm that Mo delays ferrite formation thereby promoting bainite formation. General conclusions on the potential benefits of Mo alloying will be made based on the above analysis also with respect to the interaction with increased levels of residuals as a result of moving towards a circular economy and the associated higher levels of scrap use in steel making.

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