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A correlation between mechanical properties and microstructural changes in a novel maraging steel

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In this study, three maraging steel alloys with varying Ti and Nb contents were produced. Solution annealing treatments were carried out between 800°C and 1210°C followed by aging treatment in the temperature range between 400°C and 600°C. Mechanical properties were measured combined with EBSD analysis. An increase in prior austenite grain size was observed with increasing solution annealing temperature. The grain size increased from 50?m to 800?m at solution annealing temperature 800°C and 1210°C, respectively. A correlation between measured mechanical properties and microstructural changes was found. Aging treatment above 450°C induced reverted austenite formed at martensite lath boundaries, which contributed to the enhanced ductility of the tested samples.