Uso de los diagramas de transformación de fases TTT y CCT para el diseño de rutas de fabricación de aceros avanzados de alta resistencia.

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- **Abstract:** Advanced High Strength Steels (AHSS) have been developed to meet the demands of the automotive industry, which are focused on making the use of fuel more efficient, with a special interest in reducing the weight of vehicles but without sacrificing the safety of passengers. Microstructural control is the key in the development of these steels, making it possible to obtain different degrees of resistance but with the same chemical composition. In the present work, TTT and CCT diagrams were used as a potential tool for designing an appropriate thermal treatment for the manufacture of two AHSS steels. The CCT and TTT diagrams were simulated using the JMat-Pro software version 8.0. The critical temperatures of transformation A1 and A3, were determined experimentally by dilatometry. The steel was heat treated following two routes. In the first route, a two-phase microstructure consisting on ferrite+martensite was generated, which is typical of dual phase steels (DP). The second was designed to obtain a multiphase microstructure consisting on ferrite+retained austenite+bainite+martensite, which is typical of transformation induced plasticity (TRIP) steels. The strength of the two types of steels was evaluated by uniaxial tensile tests, obtaining average values of ultimate tensile strength and % elongation of 1067 MPa and 7.51% for DP steel and 890 MPa and 30.75% for TRIP steel, respectively. These values are in accordance with those expected for this type of steels. The results show that CCT and TTT diagrams can be used to determine optimal processing conditions for the development of AHSS steels, by which time and processing costs can be reduced.