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## Plastic response and ductility of A270 steel at high temperatures

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Many engineering applications require that structural metals operate under very high temperatures, causing remarkable changes in the mechanical response compared to room temperature. In this study, thermal softening is investigated with reference to A270 stainless steel, building upon previous work where the investigation was limited to 300 °C, while the present experimental campaign extends the temperature range up to 650 °C. A remarkable coupling between temperature and plastic strain was previously observed in relation to thermal softening. Here, this aspect is analyzed in further detail across the newly extended temperature range, aiming to develop a two-variable thermal softening function capable of describing the experimental response, whereas the usual only temperature-dependent models were not suitable for this purpose, even at lower temperature ranges. Moreover, the variable ductility promoted by temperature is highlighted by analyzing the outcomes of both the length-based and the area-based formulations of strain at failure.

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