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Editor's Featured Article

Dynamic tensile behaviour of 7A04-T6 aluminium alloy at elevated temperatures

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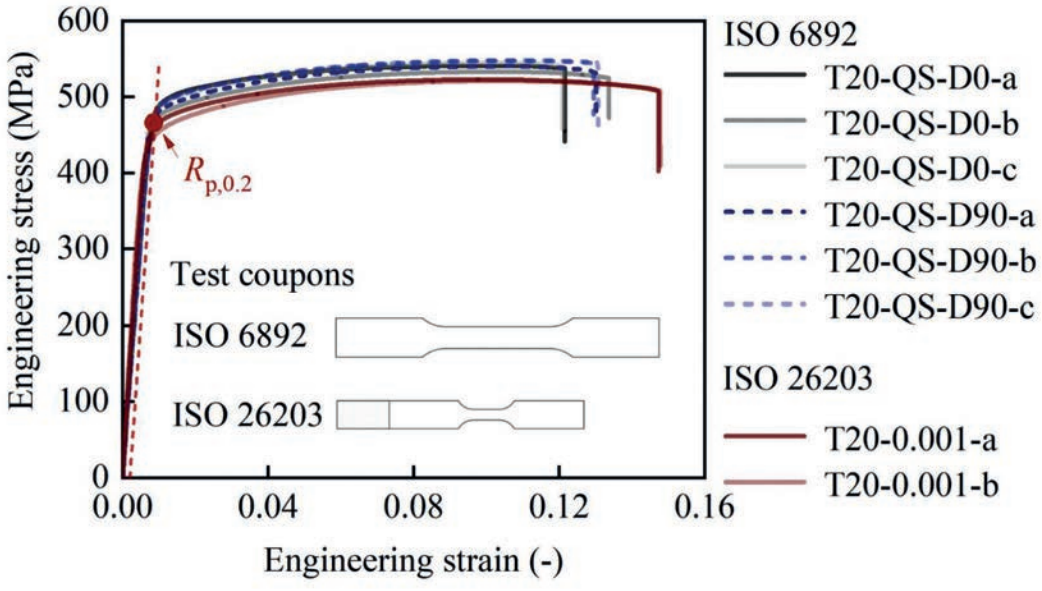
As typical light engineering metals, aluminium alloys are widely employed in modern manufacturing and construction sectors. Among them, 7A04-T6 high-strength aluminium alloy (AA7A04-T6), alloying with Zn, Mg and Cu and manufactured via the T6 temper process, is a good alternative to steel in construction and is now attractive to engineers and researchers. The structural members made from 7A04-T6 high-strength aluminium alloy are also vulnerable to a variety of accidental actions, such as impact and blast which expose the AA7A04-T6 material to both high strain rates and elevated temperature. To date, investigations into the mechanical properties of AA7A04-T6 material under the loading conditions with strain rates and temperatures coupled are still limited. Dynamic tensile tests were conducted under the rate-temperature coupling test conditions in this work, to study the influence of strain rate and temperature on the stress-strain response of AA7A04-T6 material. The ranges of the test strain rate and temperature were from 0.001 s^{-1} to 102 s^{-1} and from 20°C to 200°C, respectively. Based on the classical Johnson-Cook model and Cowper-Symonds model, a modified model was proposed for AA7A04-T6 material and good agreement is achieved in the comparison between the predictions and the measured stress-strain curves, which could facilitate the relevant fine analysis and resilient design in the future.

→| Read the full paper at **https://doi.org/10.1016/j.istruc.2024.106535**



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