



# Fracture mechanisms in flat and cylindrical tensile specimens of TRIP-TWIP $\beta$ -metastable Ti-12Mo alloy

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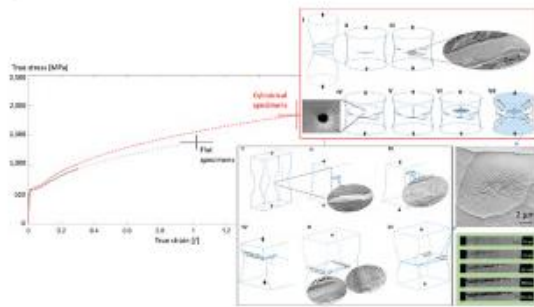
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## Abstract

Enhanced mechanical properties in terms of strain hardening capacity and uniform strain have been measured for recently developed TRIP-TWIP  $\beta$ -metastable Ti alloys. However, hardly anything has been reported about their fracture properties. An original fracture scenario including adiabatic shear banding is proposed for both flat and cylindrical tensile specimens of Ti-12wt.% Mo tested in quasi-static conditions at room temperature. The geometry of the tensile specimens has a strong influence on the fracture mechanism. The fusible coating method was used with Sn and Cu coatings to qualitatively evaluate the evolution of the temperature during fracture, colder than 232°C during crack initiation and increasing up to the melting temperature of the alloy during crack propagation. High-speed imaging was also used to estimate the evolution of the crack propagation speed, increasing up to 1,840 m. s<sup>-1</sup>, a level corresponding to unstable crack propagation. The evolution of the temperature rise and of the crack speed is linked to the specific fracture patterns.

# Graphical abstract

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