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Adapted Nakazima test to evaluate dynamic effect on strain distribution and dome height in balanced biaxial stretching condition

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HIGHLIGHTS

- The study has been focused of the effect of high strain rates on sheet formability in balanced biaxial stretching condition.
- An experimental equipment, based on the Nakazima test standard, has been designed and then mounted on a direct tension-compression Split Hopkinson Bar (SHTCB).
- Tensile tests on AA6082 sheet samples have been carried out using the same SHTCB to obtain the high strain rate behaviour of the alloy in terms of stress-strain curve.
- The strain distribution over the dumbbell-like and Nakazima specimens has been evaluated by means of optical methods.
- The constitutive behaviour of AA6082 in term of stress-strain is not affected significantly by strain rate
- The tested alloy exhibits a relevant increment in the strain to failure, both in uniaxial and balanced biaxial stretching conditions, when passing from quasi-static to high rate of loading.

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