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Experimental and theoretical investigation on the role of friction in Nakazima testing

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Highlights

- Friction has no effect on the strain path at different locations in the test specimen used in the Nakazima test.
- The range of strain paths in the specimen are determined solely by the local bending strains and the specimen geometry.
- The effect of friction in the Nakazima test is to change the relative strain rate in different locations of the specimen geometry, changing the location of where necking occurs.
- The difference in strain limits obtained for different friction conditions is caused by the difference in forming limits for the strain paths involved in the location where friction causes necking to occur.
- Once nonlinear strain path effects are taken into account, the compensated strain limits for perfectly linear strain paths are found to be identical under low and high friction conditions.
- There is no need to explicitly account for, minimize, or otherwise consider friction in Nakajima tests, as long as appropriate compensation for nonlinear strain paths are made.

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