

# Biaxial Experiments and Modeling of Mg AZ31 Sheet

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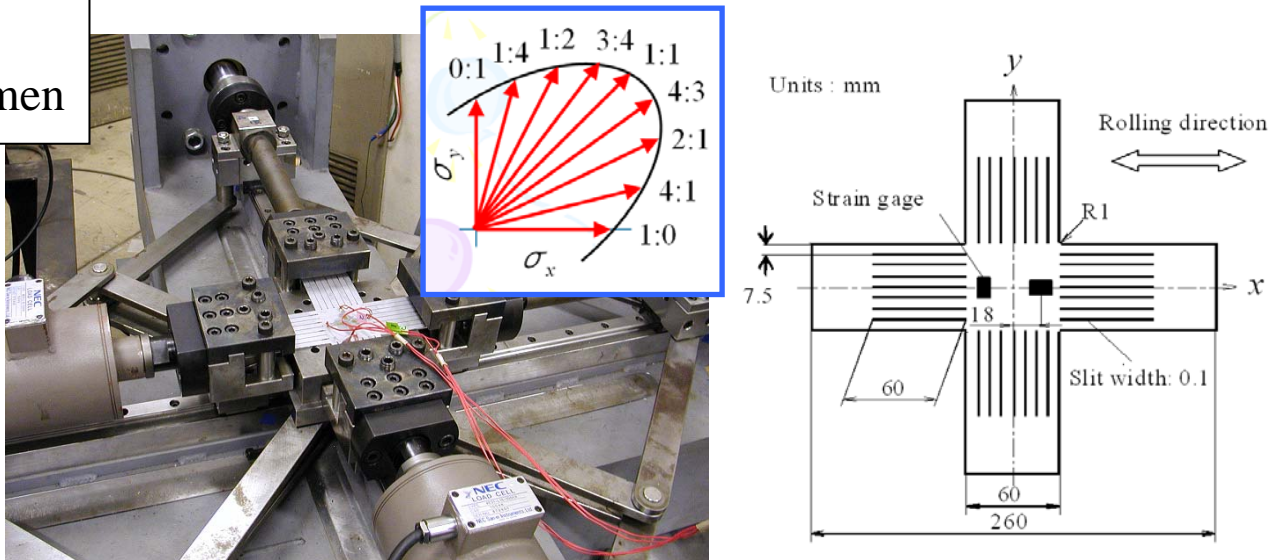
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## Summary

The biaxial tensile testing method with cruciform specimens is necessary in order to determine the mechanical responses of metal sheets subjected to biaxial loads. In this study magnesium AZ31 alloy sheet is subjected to uniaxial tension, uniaxial compression and biaxial tension. Its yielding behavior was determined over a range of plastic strain and compared with calculations using Cazacu 2006 yield criterion.

## Apparatus & Specimen

In biaxial tests cruciform specimens were loaded in rolling and transverse directions with different stress ratios. The nominal strains were measured by uniaxial strain gauges. The loads were measured by load cells, which exist one in each direction.



## Results

The biaxial stresses were determined considering the total work done per unit volume in a biaxial stress state equals that under uniaxial tension in rolling direction at specific plastic strain. The directions of plastic strain rates were also determined. The measured yield loci and directions of plastic strain rates were compared with those predicted using Cazacu 2006 yield criterion and  $a=3$  was found to provide the optimum fit with the measured data points.

