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Compaction of machining chips: Experiments and modeling

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Highlights

- Compaction of machining chips has been studied, providing an understanding not available in the literature.
- Experiments show that the flow stress, Young's modulus and Poisson's ratio of the chip material are functions of the relative density.
- A porous plasticity theory has been developed to model and predict the mechanical behavior of the chip material during and after compaction.
- The plasticity model has been implemented in a finite element code and simulations of the compaction tests, uniaxial compression tests, and diametral compression tests have been performed.
- Simulation predictions compare well with experimental measurements.

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