

Wear Properties Of Punch With Sheared Edge

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Summary

Metal forming through punching finds wide interest in industry. The punch life and the end product quality depend on the punch and workpiece properties as well as punching conditions. Recently, TiN coating of the punch surface has reported to improve considerably the tool life and the end product quality. This is because of the high hardness and low friction coefficient of TiN coating. In the present study, the wear properties of sheared edges punch is investigated through SEM micrograph and EDS analysis. Mild steel is selected as workpiece material while the punch material is cold-work tool steel (A2). The punch surface is coated with TiN (PVD) and a uniform coat thickness is assured. It is found that the wear mechanism is governed by adhesive and abrasive wear through shearing. The TiN coating protects the punch surface in the initial cycles of the punching process. As the punching cycle progresses, local defects in TiN coating are observed, i.e. coating is locally worn away.

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