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SOME ASPECTS OF CONVENTIONAL AND FINE BLANKING

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Conventional Blanking, which uses a punch and a die with liberal radial clearances is one of the fastest methods of mass production. The surface finish however, at the edge of the blanked component is rough owing to the presence of cracks around the periphery, and distortion of the component is shown as dishing and doming with the convex side towards the die.

Fine blanking is a new technique for producing high precision blanked components with smooth crack-free edges, from flat stock, in a single operation. The process requires two tooling elements in addition to the conventional punch and die, a blank holder or stripper plate which clamps the stock material against the die, and a counter punch or ejector which clamps the component against the end of the punch.

This paper reviews the two processes, and investigates the mechanism of separation of the blank from stock. A new slip line field solution is proposed for fine blanking, and results of some experiments carried on both conventional and fine blanking are reported. The experiments were performed on blanks of high-nitrogen iron. The blanking was carried out to various depths, annealed, redeformed by a further 1 % of blank thickness, aged and etched.

It is concluded, from the results obtained, that fine blanking is a shearing fracture process, in which the edge cracking is prevented by the suppression of the tensile stresses normally found in conventional blanking.

References:

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