COMPUTER AIDED DESIGN OF EXTRUSION DIES FOR A WING SPAR CAP

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A new material-Aluminium 2024 with 20 per cent SiC whiskers has been developed for aircraft structural parts. This material has a superior modulus of elasticity, compared to the conventional Aluminium alloy and can therefore reduce the weight of a typical wing structure by as much as 40 per cent.

However, a problem has been encountered in the extrusion of the complex geometries of the wing structure. Conventional extrusion technology with the use of shear dies has failed to produce these complex geometries without the loss of the critical mechanical property. A new concept is developed for the design of complex streamlined dies for the extrusion of a wing spar cap using the newly developed metal matrix comopite. The visualization and the understanding of the complex three dimensional geometry of dies are enhanced by the use of shaded colour graphics.