**Abstract:**

The use of new manufacturing concepts and advanced materials is of major interest to manufacture’s of automobile and aerospace parts to reduce weight and cost and improve part performance .One of such concepts is tailor welded blank(TWB) .This term refers to blanks where multiple sheets of material are welded together to create a single blank prior to forming process.

Tailor-welded blanks made of dissimilar, uniform or non-uniform thickness materials have potential applications in automobile industries. These TWB’s are being used to make different auto body parts by using conventional forming techniques like drawing, stretching, bending etc. The behaviour of these materials during deformation is expected to be different from that of conventional materials due to presence of weld zone and difference in properties or thickness of parent materials.

Of the various factors that influence bending process, spring back is the one that has major impact on bending of sheets. In this study spring back characteristics of tailor welded blanks in V-bending process has been investigated. The tailor welded strips used in this work were obtained by laser welding of different thickness, Cold rolled close annealed (CRCA) low carbon steel strips. These thickness of sheets used was 0.62mm &1.21mm.

These different thickness sheets were welded by 2 types of welding process: 1.GTAW, 2.Laser welding. The tensile properties of both parent metals and TWB (longitudinally welded by both GTAW &Laser) was evaluated using tension test. The Microstructure of parent metals was investigated .The V binding of these TWB’s was carried out using press. The spring back was measured on CMM.

The effect of punch profile radius on the spring back of transversely welded strips has also been investigated using pinches with four different profile radii(5.3,8.65,11,12 mm).Four sheets corresponding to each bend radius was subjected to stress relieving heat treatment and its effect was studied. Then this V bending process was simulated in Abacus software and process was analyzed, and amount of spring back was evaluated by this FEM analysis and compared with experimental results.

The effect of HAZ as a result of weld of spring back was investigated. Hardness was determined by using Micro hardness Testing Machine. Then hardness variation along HAZ was obtained from hardness profile. Then effect of HAZ on spring back was studied by comparing spring back of Laser and GTAW welded specimens.