

Accurate Simulation of Tailor-Welded-Blanks to Reduce Process Design Time for the Sheet Pressing Industry



Strategic Objectives:

- ✓ *improving concurrent engineering practices* within the tailor-welded-blank (TWB) manufacturing sector → reduction of costs, quality improvement and reduction of time-to-market
- ✓ *"right-first-time" design*, providing accurate simulation for the prediction of tailor-blank manufacture → problems are solved prior to the first prototype and should enable physical die trialling to be reduced to a maximum of 2 trials
- ✓ *improving welding technology (speed, methods and curved weld-seams)* to enable the freedom of choice in the use of high-performance steels and aluminium for tailor-blanks
- ✓ *reduction of vehicle weight while increasing safety* and *reducing fuel consumption*



Direct benefits to the SMEs:

- ✓ effective design, development and implementation of new manufacturing techniques for TWBs:
- ✓ curved weld seams, FSW welding, stamping of aluminium tailor-blanks,
- ✓ improved understanding and characterisation of laser and friction stir welding techniques,
- ✓ improved die design to control twisting and movement of weld seam,
- ✓ reduced trial-and-error and manufactured prototypes implying reduced time-to-market,
- ✓ confident use of high-performance steels and aluminium in tailor-blanks,
- ✓ improved and knowledge-based product/process design methodology from TWB using CAD-CAE
- ✓ and a closer working relationship between clients and providers,
- ✓ reduced cost of overall cost of manufacture.

Project Expected Results:

- R1:** software module for the simulation of tailor-blank forming processes
- R2:** characteristics database and know-how of welding techniques and materials
- R3:** experimental know-how of welding techniques and characterisation
- R4:** industrial know-how for improved tailor-blank forming
- R5:** industrial know-how for usage of high performance materials in tailor-blanks

Project Eligible Period: 01 September 2006 to 31 August 2008

