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ERRY YULIAN TRIBLAS ADESTA

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AKM NURUL AMIN

**DESIGN FOR MANUFACTURE**

Towards Improved Manufacturability



**IIUM Press**

# DESIGN FOR MANUFACTURE

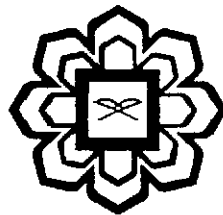
## Towards Improved Manufacturability

### EDITORS

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## Effect of Welding Process on Formability of Tailor Welded Blanks

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### 1. Introduction

Tailor welded blanks are blanks composed of sheets of dissimilar or similar thickness, strengths, coatings, etc. welded into a single blank prior to forming [2]. This allows the use of thicker or stronger materials in the critical regions of the component while thinner or lighter materials are used in other regions to reduce the component overall weight [3]. Therefore, TWBs offer an excellent opportunity to reduce manufacturing costs by reducing number of forming dies, reduced scrap, weight reductions due to the combining of parts into a single component, improved dimensional part consistency, and improved corrosion resistance through the elimination of lap joints by integration of reinforcements and the improved crash test results. Survey shows that 1% reduction in weight of vehicle implies 0.61% reductions in fuel consumption [2]. By using TWB reduction of even 40-50% in car body weights has been predicted. Some of the automotive applications of TWB include central pillar, bumper, front door, inner, rear door inner, etc. as shown in fig.1. Toyota has applied tailored blanks (in automotive bodies) since 1985 and produces 3.6 million panels for 60 applications annually [4]. The application of tailored blanks has developed in three stages. In the first stage, the use was limited to inner panels for improving material usage and panel integration. In the second stage, they were applied to outer panels mainly for improving the body appearance and assembly precision. In the third stage, they were applied to members mainly for improving the body crashworthiness and reduction of weight [5].