

**ANALYSIS OF FLASH BUTT WELDING CRACKS  
IN  
RIM MANUFACTURING**

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**A dissertation submitted to the  
Department of Mechanical Engineering of the University of Moratuwa  
in fulfillment of the requirements for the  
Degree of Master of Engineering in Manufacturing Systems  
Engineering**



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## DECLARATION

This Dissertation paper contains no material which has been accepted for the award of any other degree or diploma in any University or equivalent institution in Sri Lanka or abroad, and that to the best of my knowledge and belief, contains no material previously published or written by any other person, except where due reference is made in the text of this Dissertation. I carried out the work described in this Dissertation under the supervision of Dr. N. Munasinghe

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## Abstract

Flash butt welding is a well established economical process for solid state butt welding. It consists indirect electrical heating of the ends of the work pieces to be welded and forging them together. While heating, a thermal distribution characterized by a steep temperature gradient is established along the axial length of the pieces. Flash butt welding is widely used for steel band welding in wheel industry. Major advantages are economical in operation, suitable for mass production and high in joint strength.

Loadstar (pvt) Ltd has six flash butt machines in different production lines for rim and band manufacturing. The major problem is considerably high amount of scrap percentage due to welding cracks. This problem severely affects the lines which have severe forming or stretching operations in latter stages. For this investigation the line 05 was selected which has high scrap percentage. The main aim of this study is to analyze the flash butt welding cracks in rim manufacturing and to find out the main reasons for the defects.

The analysis of flash butt welding cracks in rim manufacturing is done in five stages. In the first stage, attention is paid to literature survey, in which the present stage of the researches carried out in the industry regarding the flash butt welding is discussed. Only few literature sources are available although there are many wheel manufacturing companies in the world. Certainly there might be a lot of researches carried out under this topic in the history, but due to high competitiveness among the companies the research outcomes might be kept as company secrets. In this project, the analysis of flash butt welding cracks in wheel manufacturing will be discussed in detail.

The second stage is process description and principles of flash butt welding. Third stage is problem identification and the fourth stage is methodology to solve the problem. In methodology it has stated that the identified process variables that affect the welding quality and how further testing are carried out. Experimental work and results are reviewed under the fifth stage. In this chapter, the testing done for research is discussed in detail and final conclusion is on how the increasing advance velocity of the movable jaw of flash butt machine while keeping the same voltage will give better results in weld joints for SS 400 material.

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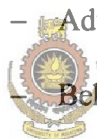


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