

Optimization on Spot Weld Parameters in Resistance Spot Welding Process on AISI 304

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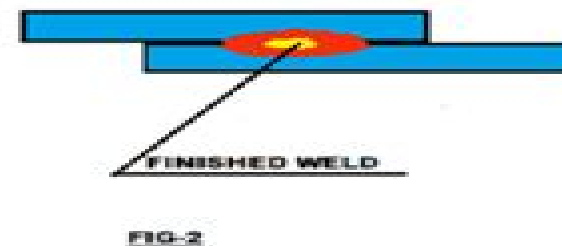
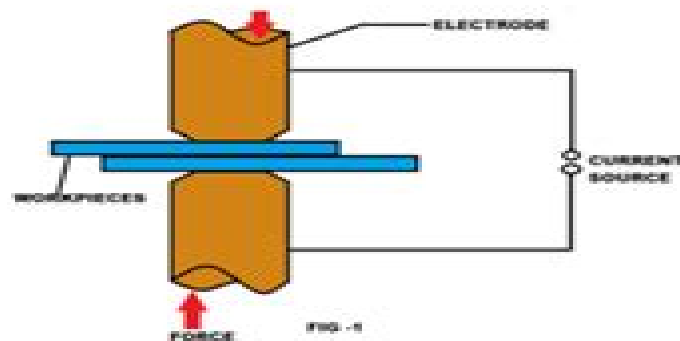
ABSTRACT

The spot welding procedure is used in a variety of industrial applications. The most critical elements influencing welding quality, productivity, and cost are the spot welding parameters. This research examines the effect of welding factors such as welding current and welding time on the strength of various welding joint designs. Resistance spot welding (RSW) is used in the automotive industry for manufacturing. This research focused on the optimization of process parameters for resistance spot welding (RSW), as well as the tensile testing and spot weld diameter. The goals of this analysis are to comprehend the physics of the process and to demonstrate the effect of electrical current, weld time, and material type on the resistance spot welding process.

Keywords-- AISI 304, Spot Welding, Workpieces

I. INTRODUCTION

Spot welding is one of the most used industrial operations. It is a sort of resistance welding in which heat is generated by using the resistance of the workpiece. Because pressure is applied throughout the welding process, resistance welding is also known as pressure welding. This procedure is distinct from others in that no flux or filler material is required for welding. In this procedure, two or more metals are bonded point to point to form the electrode tip shape. Workpieces are put between the electrodes depicted in Fig. 1, and high current is sent between them after applying pressure for a brief period of time. Parts are heated locally in all types of resistance welding. The material between the electrodes is forced together, melting and destroying the space between the sections. After the current is turned off, a "Nugget" of molten material forms after solidifying and establishing joints, as seen in Fig 2.



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Proceedings of the 7th Asia Pacific Conference on Manufacturing Systems and 6th International Manufacturing Engineering Conference—Volume 1 Siti Nadiah Mohd Saffe, Siti Zubaidah Ismail, Cucuk Nur

Rosyidi, Mohammad Osman Tokhi, 2025-05-30 This publication showcases the 7th Asia Pacific Conference on Manufacturing System and 6th International Manufacturing Engineering Conference iMEC APCOMS 2024 proceedings It emphasizes the UN Sustainable Development Goals in recent developments and significant challenges in manufacturing industry along with the emergence of intelligent manufacturing engineering and technology which are critical for adopting Industry 4.0 The book discusses both traditional and advanced approaches used in various intelligent manufacturing applications Readers can expect to gain a comprehensive understanding of current trends challenges solutions and mitigating factors from this publication

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Swarup Bag, Christ Prakash Paul, Mayuri Baruah, 2021-06-13 This book presents the select proceedings of Conference on Research and Developments in Material Processing Modelling and Characterization RDMPMC 2020 It highlights the new technologies developed in the generation of rational materials for various applications with tailored properties It covers fundamental research in emerging materials which includes biomaterials composites ceramics functionally graded materials energy materials thin film materials nanomaterials nuclear materials intermetallic high strength materials structural materials super alloys shape memory alloys and thermally enhanced materials It includes the numerical modeling and computer simulation to investigate the properties and structure of materials Few of the most relevant manufacturing techniques highlighted in this book are welding coating additive manufacturing laser based manufacturing advanced machining processes casting forming and micro and nanoscale manufacturing processes Given its contents this book is beneficial to students researchers and industry professionals Transactions on Intelligent Welding Manufacturing

Shanben Chen, Yuming Zhang, Zhili Feng, 2020-01-11 The primary aim of this volume is to provide researchers and engineers from both academic and industry with up to date coverage of new results in the field of robotic welding intelligent systems and automation The book is mainly based on papers selected from the 2019 International Workshop on Intelligentized Welding Manufacturing IWIWM 2019 in USA The articles show that the intelligentized welding manufacturing IWM is becoming an inevitable trend with the intelligentized robotic welding as the key technology The volume is divided into four logical parts Intelligent Techniques for Robotic Welding Sensing of Arc Welding Processing Modeling and Intelligent Control of Welding Processing as well as Intelligent Control and its Applications in Engineering **New Materials, Processing**

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Innovative Product Design and Intelligent Manufacturing Systems BBVL. Deepak,DRK Parhi,Pankaj C.

Jena,2020-03-13 This book gathers selected research articles from the International Conference on Innovative Product Design and Intelligent Manufacturing System ICIPDIMS 2019 held at the National Institute of Technology Rourkela India The book discusses latest methods and advanced tools from different areas of design and manufacturing technology The main topics covered include design methodologies industry 4 0 smart manufacturing and advances in robotics among others The contents of this book are useful for academics as well as professionals working in industrial design mechatronics robotics and automation

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