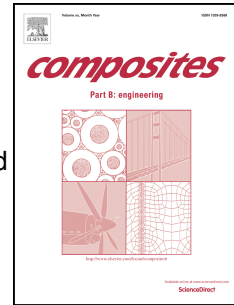


# Accepted Manuscript

Weldability of thermoplastic materials for friction stir welding- A state of art review and future applications

Ranvijay Kumar, Rupinder Singh, I.P.S. Ahuja, Rosa Penna, Luciano Feo



PII: S1359-8368(17)33582-5

DOI: [10.1016/j.compositesb.2017.10.039](https://doi.org/10.1016/j.compositesb.2017.10.039)

Reference: JCOMB 5360

To appear in: *Composites Part B*

Received Date: 18 October 2017

Accepted Date: 31 October 2017

Please cite this article as: Kumar R, Singh R, Ahuja IPS, Penna R, Feo L, Weldability of thermoplastic materials for friction stir welding- A state of art review and future applications, *Composites Part B* (2017), doi: 10.1016/j.compositesb.2017.10.039.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Weldability of thermoplastic materials for friction stir welding- A state of art review and future applications

<sup>1,2</sup>Ranvijay Kumar <sup>1</sup>Rupinder Singh, <sup>2</sup>IPS Ahuja, <sup>3</sup>Rosa Penna, <sup>3</sup>Luciano Feo

<sup>1</sup>Dept. of Production Engineering, Guru Nanak Dev Engineering College, Ludhiana (India)

<sup>2</sup>Dept. of Mech. Engineering, Punjabi University, Patiala (India)

<sup>3</sup>Dept of Civil Engineering, University of Salerno (Italy)

<sup>1,2</sup>ranvijayk12@gmail.com <sup>1</sup>rupindersingh78@yahoo.com, <sup>2</sup>ahujaiips@gmail.com, <sup>3</sup>rpenna@unisa.it, lfeo@unisa.it

### Abstract

Polymer composites have certain advantages over metals in terms of mechanical as well as metallurgical properties. These can be joined with similar as well as dissimilar polymer composites (subject to certain conditions like glass transition temperature, rheological properties etc.). In last 20-25 years number of techniques and concepts has been developed to offer the possibility of joining of polymeric materials which have similar or dissimilar characteristics. In present scenario mechanical fastening and adhesive bonding is replaced by applying welding concepts like: laser transmission welding, friction stir welding (FSW), ultrasonic welding, hot fusion resistance welding etc. The FSW is one of the most acceptable welding techniques for production of structural/ industrial components. In this present work, requirements of FSW and its process capability has been highlighted for joining of similar/dissimilar polymeric materials for future prospective.

Keywords: Friction stir welding, polymeric materials, viscosity, similar, dissimilar, composites

### 1 Introduction

Welding, a fabrication or sculptural process that joins materials, has a history as far back as the Bronze Age, where gold circular boxes estimated to be formed by pressure welding some 2000 years ago, have been recovered. One of the largest welds from this period is the Iron Pillar of Delhi in India, which was established nearly 1700 years ago. It was not until the 19th century that professional welding, as known today, was invented[1]. Ultrasonic welding for plastic materials can be considered as the most accepted process with provision of automations[2]. The

Download English Version:

<https://daneshyari.com/en/article/7212340>

Download Persian Version:

<https://daneshyari.com/article/7212340>

[Daneshyari.com](https://daneshyari.com)