

Springer Proceedings in Materials

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Zulhelmi Ismail
A. K. M. Asif Iqbal
Irfan Ahmed *Editors*

Intelligent Manufacturing and Mechatronics

Selected Articles from iM3F 2023, 7–8
August, Pekan, Malaysia

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Editors

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Preface

The fourth edition forum of the Innovative Manufacturing, Mechatronics and Materials Forum 2023 (iM3F 2023) organized by Universiti Malaysia Pahang Al-Sultan Abdullah through its Faculty of Manufacturing and Mechatronic Engineering Technology was held on 7 and 8 August 2023. The main field focuses on Manufacturing, Mechatronics as well as Materials.

About 95 submissions were received during iM3F 2023 and were reviewed in a single-blind manner, and 48 papers were advocated by the reviewers to be published in this Springer Proceedings of Materials. The editors would like to express their gratitude to all the authors who submitted their papers. The paper published in this proceeding has been thoroughly reviewed by the appointed technical review committee which consists of various experts in the field of materials and manufacturing engineering.

The conference had brought a new outlook on cutting-edge issues shared through keynote speeches by Assoc. Prof. Ir. Dr. Haji Nik Mohd Zuki Nik Mohamed, Prof. Eng Hwa Yap and Prof. Gian Antonio Susto.

Finally, the editors hope that readers find this volume informative as we thank Springer Proceedings in Materials for undertaking this volume publication. We also would like to thank the conference organization staff and the international program committees' members for their hard work.

Pekan, Pahang, Malaysia
November 2022

Radhiyah Abd. Aziz
Zulhelmi Ismail
A. K. M. Asif Iqbal
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Experimental of Hot Machining for Stainless Steel 316L Cutting Process



Nur Cholis, M. A. H. Yusoff, Syh K. Lim, and Ahmad R. Yusoff

Abstract Stainless Steel 316L having excessive tensile power and resistance to temperature with excessive manganese content resulting high roughness during cutting process. The problem occurs when machining process conduct at hot conditions to soften the workpieces. To study the cutting parameters effect on surface quality and tool wear length, different temperatures were used for turning process in this study. The experiment conducted with hot machining process at temperature conditions at 200, 300 and 400 °C. The parameters of this experiment are cutting speed of 76–149 mm/min and feed rate of 0.11–0.22 mm/rev with constant value of depth of cut. The results showed the surface roughness affects the tool wear when machining at high feed rate and cutting speed compared to lower parameters conditions. The heating source temperature affects the surface roughness, area roughness parameter and tool wear in cutting process. In conclusion, the surface quality and tool wear improved at high feed rates and cutting speeds compared to lower parameters settings.

Keywords Hot machining · Stainless steel 316L · Surface roughness

1 Introduction

Nowadays Industries aim to produce parts that have a good surface texture and should last longer to be in usable condition. The automotive and aerospace sectors are seeking for novel materials and techniques to improve the component surfaces'

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