LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	The Effect of Rotational Speed on Wear Rate of Friction Stir Welding for Joining Aluminium Composite ALSI-SIC		
Jumlah Penulis	:	3 orang (Septian Sigit Setiawan, Rifky Ismail, **Sulardjaka**)		
Status Pengusul	:	penulis ke-3 dan **corresponding author**		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	Journal of Engineering and Applied Sciences
		b. Nomor ISSN	:	1816-949X
		c. Vol, No., Bln Thn	:	11, 12 Tahun 2016
		d. Penerbit	:	Medwell Journals
		e. DOI artikel (jika ada)	:	10.36478/jeasci.2016.2781.2787
		f. Alamat web jurnal	:	https://medwelljournals.com/abstract/?doi=jeasci.2016.2781.2787
		Alamat Artikel	:	http://docsdrive.com/pdfs/medwelljournals/jeasci/2016/2781-2787.pdf
		g. Terindex	:	Scopus/ Scimagojr/SJR=0,153 (2016) dan Q3

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat) :

- [√] Jurnal Ilmiah Internasional
- [ ] Jurnal Ilmiah Nasional Terakreditasi
- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi jurnal (10%)	4,00	4,00	4,00
b. Ruang lingkup dan kedalaman pembahasan (30%)	10,50	10,00	10,25
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	11,50	11,50	11,50
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	11,50	11,50	11,50
Total = (100%)	**37,50**	**37,00**	**37,25**
Nilai Pengusul = (40% x 37,25) = 14,90			

Semarang, 2 November 2020

Reviewer 1

Dr. Agus Suprihanto, S.T, M.T.
NIP. 197108181997021001
Unit Kerja : Teknik Mesin FT UNDIP

Reviewer 2

Ir. Eflita Yohana, M.T., Ph.D.
NIP. 196204281990012001
Unit Kerja : Teknik Mesin FT UNDIP

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	The Effect of Rotational Speed on Wear Rate of Friction Stir Welding for Joining Aluminium Composite ALSI-SIC		
Jumlah Penulis	:	3 orang (Septian Sigit Setiawan, Rifky Ismail, **Sulardjaka**)		
Status Pengusul	:	penulis ke-3 dan **corresponding author**		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	Journal of Engineering and Applied Sciences
		b. Nomor ISSN	:	1816-949X
		c. Vol, No., Bln Thn	:	11, 12 Tahun 2016
		d. Penerbit	:	Medwell Journals
		e. DOI artikel (jika ada)	:	10.36478/jeasci.2016.2781.2787
		f. Alamat web jurnal	:	https://medwelljournals.com/abstract/?doi=jeasci.2016.2781.2787
		Alamat Artikel	:	http://docsdrive.com/pdfs/medwelljournals/jeasci/2016/2781-2787.pdf
		g. Terindex	:	Scopus/ Scimagojr/SJR=0,153 (2016) dan Q3

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat) :

√	Jurnal Ilmiah Internasional
	Jurnal Ilmiah Nasional Terakreditasi
	Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional [40]	Nasional Terakreditasi [ ]	Nasional Tidak Terakreditasi [ ]	
a. Kelengkapan unsur isi jurnal (10%)	4,00			4,00
b. Ruang lingkup dan kedalaman pembahasan (30%)	12,00			10,50
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12,00			11,50
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12,00			11,50
Total = (100%)	**40,00**			**37,50**
Nilai Pengusul = (40% x 37,50) = 15,00				

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:**
   Penulisan artikel sesuai dengan "Guide for Author" dari jurnal (Title, Abstract, Introduction, Materials and Methods, Results and Discussions, Conclusion, Acknowledgment, References). Substansi artikel sesuai bidang ilmu penulis ketiga yang sekaligus sebagai corresponding author (bidang keahlian material). (skor=4,00).
2. **Ruang lingkup dan kedalaman pembahasan:**
   Substansi artikel sesuai dengan ruang lingkup jurnal (engineering dan applied science). Artikel termasuk dalam bidang keahlian ilmu material yang merupakan bagian keahlian di Teknik Mesin. Kedalaman pembahasan cukup baik data lengkap dengan analisis yang cukup detil, ada 4 dari 25 rujukan yang digunakan untuk menganalisis hasil. (skor = 10,5)
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Data dan hasil penelitian yang disajikan menunjukkan adanya kebaruan informasi dengan metodologi yang lengkap. Dari 25 referensi yang digunakan 17 buah merupakan artikel jurnal yang terbit dalam waktu 10 th terakhir. (skor = 11,5).
4. **Kelengkapan unsur dan kualitas terbitan:**
   Jurnal tergolong dalam Jurnal Internasional Bereputasi (terindeks Scopus, SJR=0,153 dan Q3). (Skor = 11,50)

Semarang, 2 November 2020
Reviewer 1

Dr. Agus Suprihanto, S.T, M.T.
NIP. 197108181997021001
Unit Kerja : Teknik Mesin FT UNDIP

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	The Effect of Rotational Speed on Wear Rate of Friction Stir Welding for Joining Aluminium Composite ALSI-SIC		
Jumlah Penulis	:	3 orang (Septian Sigit Setiawan, Rifky Ismail, **Sulardjaka**)		
Status Pengusul	:	penulis ke-3 dan **corresponding author**		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	Journal of Engineering and Applied Sciences
		b. Nomor ISSN	:	1816-949X
		c. Vol, No., Bln Thn	:	11, 12 Tahun 2016
		d. Penerbit	:	Medwell Journals
		e. DOI artikel (jika ada)	:	10.36478/jeasci.2016.2781.2787
		f. Alamat web jurnal	:	https://medwelljournals.com/abstract/?doi=jeasci.2016.2781.2787
		Alamat Artikel	:	http://docsdrive.com/pdfs/medwelljournals/jeasci/2016/2781-2787.pdf
		g. Terindex	:	Scopus/ Scimagojr/SJR=0,153 (2016) dan Q3

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat) :

- [√] Jurnal Ilmiah Internasional
- [ ] Jurnal Ilmiah Nasional Terakreditasi
- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional [40]	Nasional Terakreditasi [ ]	Nasional Tidak Terakreditasi [ ]	
a. Kelengkapan unsur isi jurnal (10%)	4,00			4,00
b. Ruang lingkup dan kedalaman pembahasan (30%)	12,00			10,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12,00			11,50
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12,00			11,50
Total = (100%)	**40,00**			**37,00**
Nilai Pengusul = (40% x 37,00) = 14,80				

Catatan Penilaian artikel oleh Reviewer :

a) Kesesuaian dan kelengkapan unsur isi jurnal:
Substansi artikel sesuai bidang ilmu pengusul (penulis ke3 dan corresponding author) yaitu tentang rekayasa material yang merupakan salah bidang keahlian di Teknik Mesin. Penulisan unsur isi artikel yang meliputi: Title, Abstract, Introduction, Materials and Methods, Results and Discussions, Conclusion, Acknowledgment, References telah sesuai dengan petunjuk penulisan yang ada dalam jurnal. (nilai: 4)

b) Ruang lingkup dan kedalaman pembahasan:
Substansi artikel sesuai dengan ruang lingkup jurnal (engineering dan applied science, khususnya bidang material). Data yang dipaparkan lengkap, namun kajian pustaka yang digunakan sedikit (4 dari 25 pustaka yang digunakan). (nilai: 10,00)

c) Kecukupan dan kemutakhiran data/informasi dan metodologi:
Hasil Turnitin similarity index mendapatkan hasil 7 %, menunjukkan artikel bebas dari plagiasi. Sekitar 70 % dari pustaka merupakan jurnal bereputasi yang terbit dalam 10 tahun terakhir. (nilai: 11,5).

d) Kelengkapan unsur dan kualitas terbitan:
Jurnal terindeks Scopus, dengan SJR: 0,153 (2016) dan Q3. Editorial board lebih dari 10 negara. Kontributor lebih dari 5 negara. (nilai: 11,5)

Semarang, 2 November 2020
Reviewer 2

Ir. Eflita Yohana, M.T., Ph.D.
NIP. 196204281990012001
Unit Kerja : Teknik Mesin FT UNDIP

Document details

Journal of Engineering and Applied Sciences
Volume 11, Issue 12, 2016, Pages 2781-2787

The effect of rotational speed on wear rate of friction stir welding for joining aluminium composite ALSI-SIC (Article)

Setiawan, S.S., Ismail, R., Sulardjaka

Department of Mechanical Engineering, Faculty of Engineering, Diponegoro University, J1 Prof. Sudharto, SH., Tembalang-Semarang, Semarang, 50275, Indonesia

Abstract

View references (25)

The purpose of this investigation is to study the effect of contact between tool and composite on wear rate of the tool shoulder in friction stir welding process. Wear rate was investigated from a weight loss of the tool shoulder after the welding process for each composites. Elevated temperature was measured to reveal the relationship between temperature and wear phenomenon. Visual and microstructure studies are utilized to observe the topography in the each tool surface wear phenomenon. FSW process was done at 1080 RPM rotational speed with translational velocity of 5.652 cm sec-1 produces a low wear rate that has good wear resistance. The elevated temperature showed 269.9°C at 5 wt.% SiC, 212°C at 7.5 wt.% SiC and 258.3°C at 10 wt.% SiC, at 1080 RPM rotational speed with the translational speed 5.652 cm sec^{-1} on advancing side. Higher elevated temperature decreases the wear rate. This study explains that butt joint process produced high temperature at advancing side than retreating side in each SiC particle composition. Visual and microstructure study mention that at operating speed of 1080 RPM fewer adhesive layer is found and the measurement for the thickness shows value of 0.2331 mm. © Medwell Journals, 2016.

SciVal Topic Prominence

Topic: Friction Stir Welding | Bobbins | Welded Joints

Prominence percentile: 99.651

Chemistry database information

Substances

Al

Author keywords

Friction stir welding | Metal matrix composite | Shoulder | Value | Wear

Funding details

Funding sponsor	Funding number	Acronym
Universitas Diponegoro	314-26/UN7.5	UNDIP

Funding text

The rsearchers would llke to express their gratefulness to the Rector of Diponegoro University who funded hs research. With number of research grants: 314-26/UN7.5.l/PG/2015.

ISSN: 1816949X
Source Type: Journal
Original language: English
DOI: 10.3923/jeasci.2016.2781.2787
Document Type: Article
Publisher: Medwell Journals

References (25)

1 Bahrami, M., Dehghani, K., Besharati Givi, M.K.
A novel approach to develop aluminum matrix nano-composite employing friction stir welding technique
(2014) *Materials and Design*, 53, pp. 217-225. Cited 98 times.
doi: 10.1016/j.matdes.2013.07.006
View at Publisher

2 Ceschini, L., Boromei, I., Minak, G., Morri, A., Tarterini, F.
Effect of friction stir welding on microstructure, tensile and fatigue properties of the AA7005/10 vol.%Al_2O_{3p} composite
(2007) *Composites Science and Technology*, 67 (3-4), pp. 605-615. Cited 186 times.
doi: 10.1016/j.compscitech.2006.07.029
View at Publisher

3 Dumpala, L., Lokanadham, D.
Low cost friction stir welding of aluminium nanocomposite-A review
(2014) *Procedia Mater. Sci*, 6, pp. 1761-1769. Cited 8 times.

4 Dwivedi, D.K.
Adhesive wear behaviour of cast aluminium-silicon alloys: Overview
(2010) *Materials and Design*, 31 (5), pp. 2517-2531. Cited 133 times.
doi: 10.1016/j.matdes.2009.11.038
View at Publisher

5 Fernandez, G.J., Murr, L.E.
Characterization of tool wear and weld optimization in the friction-stir welding of cast aluminum 359+20% SiC metal-matrix composite
(2004) *Materials Characterization*, 52 (1), pp. 65-75. Cited 120 times.
doi: 10.1016/j.matchar.2004.03.004
View at Publisher

6 Fujimoto, M., Koga, S., Abe, N., Sato, Y.S., Kokawa, H.
Microstructural analysis of stir zone of Al alloy produced by friction stir spot welding

(2008) *Science and Technology of Welding and Joining*, 13 (7), pp. 663-670. Cited 30 times.
http://docserver.ingentaconnect.com/deliver/connect/maney/13621718/v13n7/s10.pdf?expires=1224494620&id=46561510&titleid=3816&accname=Elsevier+Science&checksum=A14F5B35FC419BDA3EFAE2DDABB88FB4
doi: 10.1179/136217108X347601

View at Publisher

7 Ashok Kumar, B., Murugan, N.
Optimization of friction stir welding process parameters to maximize tensile strength of stir cast AA6061-T6/AlN_p composite

(2014) *Materials and Design*, 57, pp. 383-393. Cited 39 times.
doi: 10.1016/j.matdes.2013.12.065

View at Publisher

8 Lee, W.-B., Lee, C.-Y., Kim, M.-K., Yoon, J.-I., Kim, Y.-J., Yoen, Y.-M., Jung, S.-B.
Microstructures and wear property of friction stir welded AZ91 Mg/SiC particle reinforced composite

(2006) *Composites Science and Technology*, 66 (11-12), pp. 1513-1520. Cited 78 times.
doi: 10.1016/j.compscitech.2005.11.023

View at Publisher

9 Liu, H.J., Fujii, H., Nogi, K.
Microstructure and mechanical properties of friction stir welded joints of AC4A cast aluminium alloy

(2004) *Materials Science and Technology*, 20 (3), pp. 399-402. Cited 55 times.
http://www.tandfonline.com/loi/ymst20#.VwHc2U1f1Qs
doi: 10.1179/026708304225012279

View at Publisher

10 Maeda, M., Liu, H., Fujii, H., Shibayanagi, T.
Temperature field in the vicinity of FSW-tool during friction stir welding of aluminium alloys

(2005) *Welding in the World*, 49 (3-4), pp. 69-75. Cited 27 times.
http://link.springer.com/journal/volumesAndIssues/40194
doi: 10.1007/BF03266478

View at Publisher

11 Masaki, K., Sato, Y.S., Maeda, M., Kokawa, H.
Experimental simulation of recrystallized microstructure in friction stir welded Al alloy using a plane-strain compression test

(2008) *Scripta Materialia*, 58 (5), pp. 355-360. Cited 59 times.
doi: 10.1016/j.scriptamat.2007.09.056

View at Publisher

12 Mironov, S., Zhang, Y., Sato, Y.S., Kokawa, H.
Crystallography of transformed β microstructure in friction stir welded Ti-6Al-4V alloy

(2008) *Scripta Materialia*, 59 (5), pp. 511-514. Cited 60 times.
doi: 10.1016/j.scriptamat.2008.04.038

View at Publisher

13 Ohashi, R., Fujimoto, M., Mironov, S., Sato, Y.S., Kokawa, H.
Effect of contamination on microstructure in friction stir spot welded DP590 steel

(2009) *Science and Technology of Welding and Joining*, 14 (3), pp. 221-227. Cited 51 times.
http://docserver.ingentaconnect.com/deliver/connect/maney/13621718/v14n3/s6.pdf?expires=1248467586&id=51341242&titleid=3816&accname=Elsevier+Bibliographic+Databases&checksum
doi: 10.1179/136217108X388642

View at Publisher

14 Park, S.H.C., Sato, Y.S., Kokawa, H., Okamoto, K., Hirano, S., Inagaki, M.
Boride formation induced by pcBN tool wear in friction-stir-welded stainless steels

(2009) *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, 40 (3), pp. 625-636. Cited 55 times.
doi: 10.1007/s11661-008-9709-9

View at Publisher

15 Prado, R.A., Murr, L.E., Shindo, D.J., Soto, K.F.
Tool wear in the friction-stir welding of aluminum alloy 6061 + 20% Al_2O_3: A preliminary study

(2001) *Scripta Materialia*, 45 (1), pp. 75-80. Cited 129 times.
doi: 10.1016/S1359-6462(01)00994-0

View at Publisher

16 Prado, R.A., Murr, L.E., Soto, K.F., McClure, J.C.
Self-optimization in tool wear for friction-stir welding of Al 6061+20% Al_2O_3 MMC

(2003) *Materials Science and Engineering A*, 349 (1-2), pp. 156-165. Cited 130 times.
doi: 10.1016/S0921-5093(02)00750-5

View at Publisher

17 RajKumar, V., VenkateshKannan, M., Sadeesh, P., Arivazhagan, N., Devendranath Ramkumar, K.
Studies on effect of tool design and welding parameters on the friction stir welding of dissimilar aluminium alloys AA 5052 - AA 6061 (Open Access)

(2014) *Procedia Engineering*, 75, pp. 93-97. Cited 23 times.
http://www.sciencedirect.com/science/journal/18777058
doi: 10.1016/j.proeng.2013.11.019

View at Publisher

18 Sato, Y.S., Kokawa, H., Enomoto, M., Jogan, S.
Microstructural evolution of 6063 aluminum during friction-stir welding

(1999) *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, 30 (9), pp. 2429-2437. Cited 590 times.
http://www.springerlink.com/content/1073-5623?sortorder=asc&p_o=54
doi: 10.1007/s11661-999-0251-1

View at Publisher

19 Sato, Y.S., Yamanoi, H., Kokawa, H., Furuhara, T.
Microstructural evolution of ultrahigh carbon steel during friction stir welding

(2007) *Scripta Materialia*, 57 (6), pp. 557-560. Cited 130 times.
doi: 10.1016/j.scriptamat.2007.04.050

View at Publisher

20 Sato, Y.S., Harayama, N., Kokawa, H., Inoue, H., Tadokoro, Y., Tsuge, S.
Evaluation of microstructure and properties in friction stir welded superaustenitic stainless steel

(2009) *Science and Technology of Welding and Joining*, 14 (3), pp. 202-209. Cited 45 times.
http://docserver.ingentaconnect.com/deliver/connect/maney/13621718/v14n3/s3.pdf?expires=1248467482&id=51341229&titleid=3816&accname=Elsevier+Bibliographic+Databases&checksum
doi: 10.1179/136217108X386518

View at Publisher

21 Suri, A.
An improved FSW tool for joining commercial aluminum plates
(2014) *Procedia Mater. Sci*, 6, pp. 1857-1864. Cited 9 times.

22 Thomas, W.M., Nicholas, E.D.
Friction stir welding for the transportation industries

(1997) *Materials and Design*, 18 (4-6), pp. 269-273. Cited 515 times.
https://www.journals.elsevier.com/materials-and-design
doi: 10.1016/s0261-3069(97)00062-9

View at Publisher

23 Wang, J., Su, J., Mishra, R.S., Xu, R., Baumann, J.A.
Tool wear mechanisms in friction stir welding of Ti-6Al-4V alloy

(2014) *Wear*, 321, pp. 25-32. Cited 43 times.
doi: 10.1016/j.wear.2014.09.010

View at Publisher

24 Yasavol, N., Abdollah-Zadeh, A., Vieira, M.T.F., Jafarian, H.R.
Microstructure evolution and texture development in a friction stir-processed AISI D2 tool steel

(2014) *Applied Surface Science*, 293, pp. 151-159. Cited 12 times.
http://www.journals.elsevier.com/applied-surface-science/
doi: 10.1016/j.apsusc.2013.12.122

View at Publisher

25 Zhang, Y., Sato, Y.S., Kokawa, H., Park, S.H.C., Hirano, S.
Stir zone microstructure of commercial purity titanium friction stir welded using pcBN tool

(2008) *Materials Science and Engineering A*, 488 (1-2), pp. 25-30. Cited 102 times.
doi: 10.1016/j.msea.2007.10.062

View at Publisher

Sulardjaka, ; Department of Mechanical Engineering, Faculty of Engineering, Diponegoro University, J1 Prof. Sudharto, SH., Tembalang-Semarang, Semarang, Indonesia

Source details

Journal of Engineering and Applied Sciences

Scopus coverage years: from 2008 to 2019
(coverage discontinued in Scopus)
Publisher: Medwell
ISSN: 1816-949X E-ISSN: 1818-7803
Subject area: Engineering: General Engineering

SJR 2019
0.154

SNIP 2019
0.289

View all documents > Set document alert Save to source list

CiteScore CiteScore rank & trend Scopus content coverage

Improved CiteScore methodology
CiteScore 2017 counts the citations received in 2014-2017 to articles, reviews, conference papers, book chapters and data papers published in 2014-2017, and divides this by the number of publications published in 2014-2017. Learn more >

CiteScore 2017

$$0.2 = \frac{282 \text{ Citations } 2014 - 2017}{1{,}685 \text{ Documents } 2014 - 2017}$$

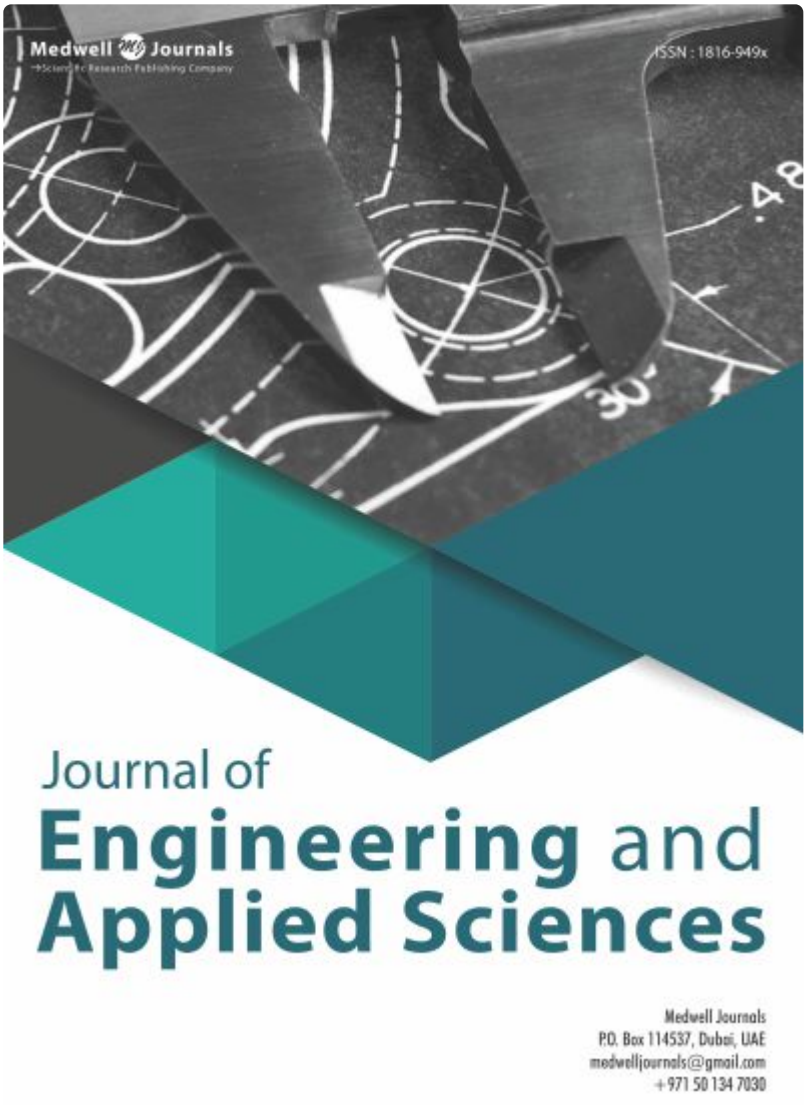
Calculated on 01 May, 2018

= —

CiteScore rank 2017

Category	Rank	Percentile
Engineering └ General Engineering	#245/276	11th

View CiteScore methodology > CiteScore FAQ >



medwelljournals@gmail.com
+971 50 134 7030

Journal of Engineering and Applied Sciences (2020 Volume 15)

Number of issues per year: 24

ISSN: 1816-949x (Print)

ISSN: 1818-7803 (Online)

About | Current Issue

Archive | Editors

Guide

Editorial Board

Director of Publications Muhammad Kamran

Editorial Board Members

Dr. Dimitris Kanellopoulos	Greece
Ahmed A. Hamoud	Yemen
Dr Murat Karakus	Turkey
Dr Oleg Makarynskyy	Australia
Dr ZEDIRA Hamma	Algeria
Dr. A.M.S. Hamouda	Qatar
Dr. Adel M. Alimi	Tunisia
Dr. Afaq Ahmad	Oman
Dr. Amir Nassirharand	Iran
Dr. Angelo Basile	Italy
Dr. Baowen Xu	China
Dr. Bensafi Abd El Hamid	Algeria

Journal of Engineering and Applied Sciences (2020 Volume 15)

Number of issues per year: 24

ISSN: 1816-949x (Print)

ISSN: 1818-7803 (Online)

About Current Issue

Archive Editors

Guide

Archive (Volume 11 Issue 12, 2016)

Ultrasonic Irradiation: A Novel Approach for Conductive Polymer

M.E. Ali Mohsin, Munirah Elias, Agus Arsad, Azman Hassan and Othman Y. Alothman

Extraction of Oil from Filter Cake Sludge Using Soxhlet Extraction

Anees Ameera Fauzi, Agus Arsad, Muhammad Abbas Ahmad Zaini and Mohd Amri Bin Md Yunus

Preparation and Characterization of Microcrystalline Cellulose from Cellulose Based-Agro Wastes

Voravadee Suchiya, Pranut Potiyaraj and Duangdao Aht-Ong

Impression Creep of Mg-1.5Ca and Mg-3.0Ca Alloys

Widyani Darham, Mahesh Kumar Talari, Ahmad Lutfi Anis and Nagumothu Kishore Babu

Microstructure and Hardness Improvement of Ti-6AL-4V Alloys VIA Boron Addition

Ahmad Lutfi Anis, Mahesh Kumar Talari, Widyani Darham, N. Kishore Babu and Muhammad Hussain Ismail

Pyrolysis of Oil Palm Kernel Shell into Liquid Smoke and its Application to Control Anthracnose Disease on Chili (*Capsicum annum* L.)

M. Faisal, Asri Gani, Husni , Akhmad Baihaqi and Hiroyuki Daimon

Particulate Matter Status and its Relationship with Meteorological Factors in the East Coast of Peninsular Malaysia

Marzuki Ismail, Fong Si Yuen and Sam Suri Abdullah

The Characteristics of Unit Hydrographs with Different Scale of Antecedent Soil Moisture Condition

Sasmito , B. Triatmodjo, J. Sujono and Br. Sri Harto

Implementation of Standardization Work to Improve Productivity in Indonesian Furniture Industry

Bambang Suhardi, Anastasia Puspita Sari and Pringgo Widyo Laksono

Stress and Deformation Analysis of a Crankshaft in Range Extender Engine

Suherman , Bambang Wahono, Achmad Praptijanto, Widodo Budi Santoso, Arifin Nur and Muhammad Khristamto Aditya Wardana

The Use of Three-Phase Fault Analysis for Rating Circuit Breakers on Nigeria 330 kV Transmission Lines

Ademola Abdulkareem, C.O.A. Awosope and A.A. Awelewa

Grain Bread with Buckwheat Bran Flour for a Healthy Diet

Nadezhda N. Alekhina, Elena I. Ponomareva, Svetlana I. Lukin and Alexandr A. Smirnykh

Increasing the Life Time of Wireless Sensor Networks by Applying Dual-Cluster Head and Angular Clustering in Mobile Base Mode

Abbas Ezoji

Investigating the Effectiveness of Metacognitive-Focused Group Therapy on Improvement of Meta-Cognitive Beliefs and Thought Control in Patients with Obsessive-Compulsive Disorder (OCD)

Rahimeh Hamedi and Akbar Atadukht

Management of Linear Switched Reluctance Generator Without a Translator Position Sensor

A.V. Kireev, N.M. Kozhemyaka and A.S. Burdugov

Integrating FPGAs with Trigger Circuitry Core System Insertions for Observability in Debugging Process

A. Murali, K. Hari Kishore and D. Venkat Reddy

Natural Radioactivity Levels in Rocks from Ogun State, Nigeria

M.R. Usikalu, W.A. Ayara and F.O. Olawole

Recycling Rice Husk Ash Waste for Clay Bricks

Synthesis and Characterization of Biocomposite Super Absorbent Polymer (SAP) Based on Aren Fiber (*Arenga pinnata* Merr) and Polyacrylamida (PAM) for Dry Land

Supriyanto and Muhammad Iqbal Gifari

Thermal and Mechanical Properties of Polylactic Acid Filled with Organosilane Modified Cellulose Fibril

Sarit Thanomchat and Kawee Srikulkit

The Results of Experimental Studies of Processes Occurring Within Combined Traction Levitation System

Alexander Kireev, Nikolay Kozhemyaka and Gennady Kononov

Thermal, Electrical and Structural Characterization of MI-AgI (M = Na, Li) Systems above Room Temperatures

J.A. Trujillo, A. Garcia-Muriel, E.E. Quinones, Ruben-Dario Ortiz-Ortiz and Ana-Magnolia Marin-Ramirez

Strengthening of Porous Alumina Ceramics Using (Cu) Metal in Nanoscale Particle and Graphite Waste as a Pore Agent

Mohammed Sabah Ali, M.A. Azmah Hanim, C.N.A. Jaafar, S.M. Tahir, M. Norkhairunnisa and Khamirul Amin Matori

Justification of Operating Conditions for Gas Supply Systems Based on Cylinder Units of Liquefied Hydrocarbon Gas

N.N. Osipova, B.M. Grishin, Y.V. Rodionov, O.V. Tarakanov and G.I. Greysoukh

Evaluation of Efficiency Techniques for Spectrum Decision Making in Cognitive Radio Wireless Networks

Angela Patricia Garcia, Danilo Lopez Sarmiento and Edwin Trujillo

Mathematic Model and an Improved Evolutionary Algorithm for Bi-Objective Vehicle Routing Problem with Dynamic Requests

Messaoud Elhassania and Elhilali Alaoui Ahmed

Time Fractional Wave Equation in the Caputo Sense

Ana-Magnolia Marin-Ramirez, Ruben-Dario Ortiz-Ortiz and Hanner Campuzano-Estrada

Improving the Performance of Generalized Frequency Division Multiplexing (GFDM) Modulation Scheme by Usingwalsh Hadamard Transform (WHT) Pre-Coded

Muhammad Barideh

Geometrization of Physical-Mechanical Properties of Rocks Based on the Solution of the Inverse Problem of Diagnostics of a Condition of Geophysical Parameters

D.N. Shurygin, N.I. Gorbatenko, V.V. Grechikhin and D.V. Shaykhutdinov

Effect of Blade Tip Geometry on Centrifugal Compressor Performance and Stability

Ibrahim Shahin

An Oligolactide Acrylate for UV-Curable Screen Printing Inks

Santi Kulsiriswad, Kawee Srikulkit and Onusa Saravari

The Effect of Rotational Speed on Wear Rate of Friction Stir Welding for Joining Aluminium Composite ALSI-SIC

Septian Sigit Setiawan, Rifky Ismail and Sulardjaka

Growth of GaAsSb Thin Film by Vertical-MOCVD and their Characterization

Andi Suhandi, Yuyu R. Tayubi and Pepen Arifin

Analysis of Voters Mapping on 2014 Presidential Election in Indonesia Based on Standardized Incidence Ratio Method

Benny Yong and Nor AzahSamat

Closed-Form Optimal Batch Size Equation to Minimize Process Lead Time for Single Machine

Nithiphong Vikitset and Athapol Ruangkanjanases

Corrosion Mechanism on Carbon Steel Coated with WC-10%Ni

Muhammad Mujibuddin Bin Mustain and Azzura Binti Ismail

Data Selection and Collection for Printed Quranic Documents

Ruziana Mohamad Rasli, Mime Azrina Jaafar, Faudziah Ahmad and Siti Sakira Kamaruddin

Barriers of Adopting E-Learning in Developing Countries

Ahmed Fahad, Zainuddin Hassan and Zahraa Salman

An Investigation on the Seismic Behavior of Segmental Boxed Bridges with Post-Tensioning

Seyyed Ashkan Mostajab Aldavat, Reza Lamei, Majid Barazandeh Tehrani and Selma Teymouri

Assessment of the Different Arrangement of the Electrodes in the Capacitive Sensor in Two-Phase Flow Using Numerical Simulation and the Introduction of a New Electrode

Abbas Soleimani Manesh and Naser Teymoori Khanesari

Journal of Engineering and Applied Sciences 11 (12): 2781-2787, 2016
ISSN: 1816-949X

The Effect of Rotational Speed on Wear Rate of Friction Stir Welding for Joining Aluminium Composite ALSI-SIC

Septian Sigit Setiawan, Rifky Ismail and Sulardjaka
Department of Mechanical Engineering, Faculty of Engineering, Diponegoro University,
Jl. Prof. Sudharto, SH., 50275 Tembalang-Semarang, Semarang, Indonesia

Abstract: The purpose of this investigation is to study the effect of contact between tool and composite on wear rate of the tool shoulder in friction stir welding process. Wear rate was investigated from a weight loss of the tool shoulder after the welding process for each composites. Elevated temperature was measured to reveal the relationship between temperature and wear phenomenon. Visual and microstructure studies are utilized to observe the topography in the each tool surface wear phenomenon. FSW process was done at 1080 RPM rotational speed with translational velocity of 5.652 cm sec^{-1} produces a low wear rate that has good wear resistance. The elevated temperature showed 269.9°C at 5 wt.% SiC, 212°C at 7.5 wt.% SiC and 258.3°C at 10 wt.% SiC, at 1080 RPM rotational speed with the translational speed 5.652 cm sec^{-1} on advancing side. Higher elevated temperature decreases the wear rate. This study explains that butt joint process produced high temperature at advancing side than retreating side in each SiC particle composition. Visual and microstructure study mention that at operating speed of 1080 RPM fewer adhesive layer is found and the measurement for the thickness shows value of 0.2331 mm.

Key words: Friction stir welding, metal matrix composite, wear, shoulder, value

INTRODUCTION

In 1991, Friction Stir Welding (FSW), a new joining techinque was developed by The Welding Institute (TWI) of Cambridge, England (Thomas and Nicholas, 1997). FSW is on kind of solid-state joining technique that has popularity in wide variety of industries including the aerospace, railway, land transportation and marine industries. This method often used on low melting point metal alloys such as aluminium (RajKumar *et al*., 2014; Suri, 2014; Masaki *et al*., 2008; Sato *et al*., 1999; Fujimoto *et al*., 2008), copper, titanium (Zhang *et al*., 2008; Mironov *et al*., 2008) and even iron (Sato *et al*., 2007, 2013; Ohashi *et al*., 2009; Ceschini *et al*., 2007; Kumar and Murugan, 2014; Liu *et al*., 2004) and its alloys.

The FSW process composed three phenomena: heating process, deformation process and forging process. A non consumable rotating tool was used, consisting of a pin and shoulder. The shoulder of the tool is forced against the specimen to take action. The rotating tool causes friction and heats the plates so the mechanical strength decreases. Friction stirs weld has fine microstructure, unlike the fusion weld there is no solidification products and the grains in the weld region are equiaxed and highly refined (Dumpala and Lokanadham, 2014).

Only few researches explained tool wear (Wang *et al*., 2014; Park *et al*., 2009) but that occurs in the FSW process to join the metal matrix composite materials is rarely found (Dumpala and Lokanadham, 2014; Lee *et al*., 2006; Bahrami *et al*., 2014; Prado *et al*., 2001, 2003), especially, today where the FSW process for composites more widely used.

To improve the productivity and efficiency a study is needed to determine the wear rate of the tool shoulder in the FSW process of MMC. Wear of the tool shoulder reduced the quality of FSW joining. Controlling wear is done by determining the efficient parameters and the suitable tool material to join the composite material. This study is investigating the effect of rotational speed on the wear rate of the tool shoulder in the FSW process for AlSi-wt.% SiC composite. This written report also observed effect of the gain in heat (elevated temperature) generated during the procedure.

MATERIALS AND METHODS

Experimental: The FSW process moved the x-axis as the translational speed of the welding parameters. Rotational speed was varied with translational velocity that works effectively on each of them. The parameter is used to determine the effective translational speed of the welding

Corresponding Author: Sulardjaka, Department of Mechanical Engineering, Faculty of Engineering, Diponegoro University, Jl. Prof. Sudharto, SH., 50275 Tembalang-Semarang, Semarang, Indonesia

Journal of Engineering and Applied Sciences 11 (12): 2566-2572, 2016
ISSN: 1816-949X

Preparation and Characterization of Microcrystalline Cellulose from Cellulose Based-Agro Wastes

[1, 2]Voravadee Suchiya, [1, 2]Pranut Potiyaraj and [1, 2]Duangdao Aht-Ong
[1]Department of Materials Science, Faculty of Science, Chulalongkorn University, 10330 Bangkok, Thailand
[2]Center of Excellence on Petrochemical and Materials Technology, Chulalongkorn University, 10330 Bangkok, Thailand

Abstract: Two types of agricultural wastes, Bagasse (BG) and Banana Stem (BS) were extracted and hydrolyzed into Microcrystalline Cellulose (MCC) by acid hydrolysis using HCl and H_2SO_4. The suitable condition for preparing MCC from each agricultural waste was investigated. From the results of Thermogravimetric Analysis (TGA), the suitable NaOH concentrations for delignification of BG and BS fiber were 0.5 and 1 M, respectively. The most appropriate bleaching condition giving high whiteness and less degradation of both pulps was 6% H_2O_2 in alkali solution. For H_2SO_4 hydrolysis, BG and BS MCC achieved their unchanged average particle sizes (6-7 μm) and equilibrium Degree of Polymerization (DP) values (233-256) within 60 and 30 min, respectively. Whereas, the optimum conditions for BG and BS hydrolyzed with 2.5 N HCl to obtain their unchanged average particle sizes (6-7 μm) and equilibrium DP values (238-303) were at 120 and 60 min, respectively. In addition, particle size of all obtained BG and BS MCCs was smaller than Commercial Microcrystalline Cellulose (CM-MCC).

Key words: Microcrystalline cellulose, acid hydrolysis, degree of polymerization, biopolymer, bagasse, banana stem

INTRODUCTION

Microcrystalline Cellulose (MCC) which is extracted from natural fiber is usable for pharmaceutical, cosmetic, food and plastic composite fields owing to its compatibility, hydrophilicity, acid-insolubility and biodegradability (Thoorens *et al*., 2014) Alpha cellulose which is mostly found in plant and natural fiber is the well-known raw material for microcrystalline cellulose preparation. Cellulose chain consists of a large number of glucose molecules linked together with β-1,4 glycosidic bond. Its molecular chain is arranged in order and disorder forms resulted in its crystalline and amorphous structures (Thoorens *et al*., 2014). Generally, three steps which are delignification, bleaching and hydrolysis are necessary for microcrystalline cellulose preparation from natural fiber. For the first and second steps, natural fiber or native fiber are needed to be treated with alkaline solvent to remove impurity from cellulose fiber before hydrolysis, since cellulose is covered with impurities that are wax, hemicellulose, lignin and other compositions (Adel *et al*., 2010), Next, the hydrolysis process is used to reduce the crystalline cellulose into small size. The dilute acid hydrolysis (e.g., hydrochloric and sulfuric acids) is widely used in industrial scale owing to its reasonable price. During this process, acid solution can penetrate into voids of amorphous region prior to crystalline region and break down at glycosidic bond, leading to small size of crystalline structure in micro scale (Adel *et al*., 2010). However, many factors such as cellulose source, acid type, reaction time and temperature have been found to affect on morphology such as size and shape and Degree of Polymerization (DP) of obtained microcrystalline cellulose (Sakhawy and Hassan, 2007). Thailand is one of the famous agricultural countries; consequently, after cultivation many kinds of agricultural wastes have been found and needed to be discarded or utilized in proper and useful approaches. Sugarcane and banana can grow very well in Thailand, particularly approximately 50 million tones of sugarcane is yearly produced in this country. These agricultural wastes are cheap and abundant; moreover, they are rich in cellulose content. Approximately 32-48% (Reddy and Yang, 2005) and 60-65% (Deepa *et al*., 2011) of cellulose can be found in bagasse and banana stem, respectively. Accordingly, these agricultural wastes are of interest to

Corresponding Author: Voravadee Suchiya, Department of Materials Science, Faculty of Science, Chulalongkorn, University, 10330 Bangkok, Thailand

Journal of Engineering and Applied Sciences 11 (12): 2639-2642, 2016
ISSN: 1816-949X

Management of Linear Switched Reluctance Generator Without a Translator Position Sensor

A.V. Kireev, N.M. Kozhemyaka and A.S. Burdugov
Closed Joint-Stock Company "Scientific-Technical Center PRIVOD-N",
Krivoshlykova St., 4a, Novocherkassk City, 346428 Rostov Region, Russia

Abstract: This study describes the way of non-sensor management of linear switched reluctance generator, based on analysis of characteristics of phase current impulses with fixed duration.

Key words: Regenerative shock absorber, linear reluctance machine, translator's position sensor, management, reluctance generator

INTRODUCTION

The problem of energy efficiency in automobiles is becoming more important and continuing to be the focus of attention of leading auto manufacturers. One of the alternative solutions is regeneration of mechanical vibration energy of car body into electrical energy. In particular, one of such solutions is application of regenerative shock absorber based on linear electromechanical converter as a part of car suspension, including the active suspension system. The main advantage of the linear electric machine is an immediate transformation reciprocating motion energy into electric energy without intermediate stage. Such kind of devices can be applied not only in the vehicle suspension system but also in the suspensions of a driver's seat, a cabin and a motor.

As a linear electrical machine for regenerative shock absorber it is possible to use a switched reluctance generator or a generator with permanent magnets. In terms of specific power the generator with permanent magnets has an advantage, however, the simpler design and the lack of expensive magnets make the inductor generator more attractive in terms of price.

For operation of switched reluctance generator it is required the translator position sensor (the rod of shock absorber) which ensures the switching accuracy of phase windings. It is possible to apply Hall sensors, electrooptical component, inductor sensors or other types. The position sensor generates impulses depending on the translator position while the control system of generator's converter, based on these signals, manages the power transistors. Therefore, we come to the needed operational modes and required working conditions for switched reluctance generator. The exclusion of the translator position sensor allows us to optimize the final cost of shock absorber, to simplify the design, to increase the specific power by means of expanding the work space of generator. At the same time the translator position is defined indirectly by electrical parameters available for measuring: voltage and current of motor stator (Schroder, 2001; Arakelyan and Glukhen'kii, 2003; Lisowski and Semenov, 2004; Adadurov, 2008).

MATERIALS AND METHODS

Method for determining the position of translator: In order to detect the translator position during moving it is proposed to use the characteristics of phase current impulses Δi_{ph} of fixed duration Δt. In addition, the main information parameter is the point of current impulse minimum. Figure 1 shows the sequence of current impulses $\Delta i_{ph}(t)$ in three-phase linear switched reluctance generator. For comparative evaluation it is also presented the signals of position sensors of appropriate phases PS_A, PS_B, PS_C.

Inductivity of generator phase winding L_{ph} cycles while the tooth of translator moves forward and backward to stator tooth. Due to this fact, at a different translator position relative to the stator for the same time intervals Δt and under the constant voltage supply of generator, the values of current impulse amplitudes Δi_{ph} are inversely proportional to instantaneous values of phase winding inductivity. Current impulse frequency is defined by the time of current decay in phases till zero as well as by acceptable switching frequency of power transistors in the converter controlling the linear generator. According to the series of current impulses Δi_{ph} (t), supplying each

Corresponding Author: A.V. Kireev, Closed Joint-Stock Company "Scientific-Technical Center PRIVOD-N", Krivoshlykova St., 4a, Novocherkassk City, 346428 Rostov Region, Russia