

# Scopus

## Document details

< Back to results | 1 of 1


Export Download Print E-mail Save to PDF Add to List More... >

[Full Text](#) View at Publisher

Advanced Materials Research  
Volume 845, 2014, Pages 857-861  
1st International Materials, Industrial, and Manufacturing Engineering Conference, MIMEC 2013; Johor Bahru; Malaysia; 4 December 2013 through 6 December 2013; Code 101778

### Investigation of recast layer of non-conductive ceramic due to micro-EDM

(Conference Paper)

Mohamed, A.R. ✉, Asfana, B. ✉, Ali, M.Y. ✉ 

Department of Manufacturing and Materials Engineering, International Islamic University Malaysia, P.O. Box 10, 50728 Kuala Lumpur, Malaysia

#### Abstract

[View references \(9\)](#)

This paper presents the investigation of minimum recast layer of zirconium oxide (ZrO<sub>2</sub>) due to micro-EDM using EDM-3 synthetic oil as dielectric fluid and tungsten as the tool electrode with control parameters of rotational speed and gap voltage. The investigation was performed using multi-process micro machine tools DT 110. The recast layer thickness was observed using scanning electron microscope and its hardness was measured using micro-Vickers hardness tester. The hardness data were analyzed and an empirical model was developed. The optimum value for minimum recast layer hardness was 873.46 Hv with rotational speed of 395 rpm and gap voltage of 110 V. © (2014) Trans Tech Publications, Switzerland.

#### Author keywords

Assisting electrode method (AEM) Electro discharge machining (EDM) Non-conductive ceramic Recast layer

#### Indexed keywords

- Assisting electrode
- Control parameters
- Dielectric fluid
- Electro discharge machining
- Micro machine tool
- Micro Vickers hardness
- Non-conductive ceramic
- Recast layer

Engineering controlled terms: Ceramic materials Industrial research Electric discharges Scanning electron microscopy Hardness Industrial engineering

Engineering main heading: Micromachining

Metrics  View all metrics >

- 1 Citation in Scopus  
55th Percentile
- 0 Field-Weighted Citation Impact



PlumX Metrics 

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

#### Cited by 1 document

Micromachining

Ali, M.Y. , Hung, W.N.P. (2016) *Comprehensive Materials Finishing*

[View details of this citation](#)

Inform me when this document is cited in Scopus:

[Set citation alert >](#) [Set citation feed >](#)

#### Related documents

Investigation of material removal characteristics in EDM of nonconductive ZrO<sub>2</sub> ceramic

Sabur, A. , Ali, M.Y. , Maleque, Md.A. (2013) *Procedia Engineering*

Micromachining

Ali, M.Y. , Hung, W.N.P. (2016) *Comprehensive Materials Finishing*

Effect of peak current on material removal rate for electrical discharge machining of non-conductive Al<sub>2</sub>O<sub>3</sub> ceramic

Moudood, M.A. , Sabur, A. , Ali, M.Y.

ISBN: 978-303785936-0  
Source Type: Book series  
Original language: English



Document Type: Conference Paper

(2014) *Advanced Materials Research*

[View all related documents based on references](#)

## References (9)

[View in search results format >](#)

All [Export](#)  [Print](#)  [E-mail](#) [Save to PDF](#) [Create bibliography](#)

- 1 Chen, Y.-F., Lin, Y.-J., Lin, Y.-C., Chen, S.-L., Hsu, L.-R.  
**Optimization of electrodischarge machining parameters on ZrO<sub>2</sub> ceramic using the Taguchi method**

(2010) *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 224 (2), pp. 195-205. Cited 24 times.  
doi: 10.1243/09544054JEM1437

[View at Publisher](#)

- 2 Tani, T., Fukuzawa, Y., Mohri, N., Saito, N., Okada, M.  
**Machining phenomena in WEDM of insulating ceramics**

(2004) *Journal of Materials Processing Technology*, 149 (1-3), pp. 124-128. Cited 42 times.  
doi: 10.1016/j.jmatprotec.2003.12.027

[View at Publisher](#)

- 3 Guo, Y., Deng, G., Bai, J., Lu, Z.  
**Electrical Discharge Machining (EDM) phenomena of insulating ZrO<sub>2</sub> ceramics with assisting electrode**

(2008) *Key Engineering Materials*, 375-376, pp. 313-317. Cited 6 times.

[View at Publisher](#)

- 4 Muttamara, A., Fukuzawa, Y., Mohri, N., Tani, T.  
**Effect of electrode material on electrical discharge machining of alumina**

(2009) *Journal of Materials Processing Technology*, 209 (5), pp. 2545-2552. Cited 20 times.  
doi: 10.1016/j.jmatprotec.2008.06.018

[View at Publisher](#)

- 5 Fukuzawa, Y., Mohri, N., Gotoh, H., Tani, T.  
**Three-dimensional machining of insulating ceramics materials with electrical discharge machining**

(2009) *Transactions of Nonferrous Metals Society of China (English Edition)*, 19 (SUPPL. 1), pp. s150-s156. Cited 13 times.  
doi: 10.1016/S1003-6326(10)60263-4

[View at Publisher](#)

- 6 Hösel, T., Müller, C., Reinecke, H.  
**Spark erosive structuring of electrically nonconductive zirconia with an assisting electrode**

(2011) *CIRP Journal of Manufacturing Science and Technology*, 4 (4), pp. 357-361. Cited 17 times.  
doi: 10.1016/j.cirpj.2011.05.005

[View at Publisher](#)

Find more related documents in Scopus based on:

[Authors >](#) [Keywords >](#)

- 7 Cho, D.-H., Lee, S.-A., Lee, Y.-Z.  
Mechanical properties and wear behavior of the white layer

(2012) *Tribology Letters*, 45 (1), pp. 123-129. Cited 11 times.  
doi: 10.1007/s11249-011-9869-4

[View at Publisher](#)

- 8 Rao, G.K.M., Satyanarayana, S., Praveen, M.  
Influence of machining parameters on electric discharge machining of maraging steels - an experimental investigation  
(2008) *Proc. WCE*, 2008, p. 2.

- 9 Zeng, Z., Wang, Y., Wang, Z., Shan, D., He, X.  
A study of micro-EDM and micro-ECM combined milling for 3D metallic micro-structures

(2012) *Precision Engineering*, 36 (3), pp. 500-509. Cited 34 times.  
doi: 10.1016/j.precisioneng.2012.01.005

[View at Publisher](#)

Department of Manufacturing and Materials Engineering, International Islamic University Malaysia, P.O. Box 10, Malaysia

© Copyright 2014 Elsevier B.V., All rights reserved.

[Back to results](#) | 1 of 1

[Top of page](#)

## About Scopus

[What is Scopus](#)  
[Content coverage](#)  
[Scopus blog](#)  
[Scopus API](#)  
[Privacy matters](#)

## Language

[日本語に切り替える](#)  
[切换到简体中文](#)  
[切换到繁體中文](#)  
[Русский язык](#)

## Customer Service

[Help](#)  
[Contact us](#)

**ELSEVIER**

[Terms and conditions](#) [Privacy policy](#)

Copyright © 2017 Elsevier B.V. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

Cookies are set by this site. To decline them or learn more, visit our [Cookies page](#).

 RELXGr