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Investigation of process parameters for stable micro dry wire electrical discharge machining (Article)

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Abstract

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Micro dry wire electrical discharge machining (μ DWEDM) is a process where gas is used as the dielectric fluid instead of a liquid. In this process, certain modifications of wire electrical discharge machining (WEDM) are needed during the machining operation to achieve stable machining. Smooth and stable machining operation in μ DWEDM process remains as a critical issue. Thus, this paper presents the investigation of process parameters for a stable μ DWEDM process. The investigation was performed on a stainless steel (SS304) with a tungsten wire as the electrode using integrated multi-process machine tool, DT 110 (Mikrotools Inc., Singapore). The experimentation method used in this phase was a conventional experimental method, one-factor-at-a-time (OFAT). Types of dielectric fluid, dielectric fluid pressure, polarity, threshold, wire tension, wire feed rate, wire speed, gap voltage, and capacitance were the controlled parameters. The machined microchannels were observed using scanning electron microscope (SEM). Stable and smooth machining operation of μ DWEDM was found to be with compressed air as the dielectric fluid, workpiece positive polarity, 24% threshold, 0.0809 N wire tension, 0.2 μ m/s wire feed rate, and 0.6 rpm wire speed. © 2019, Springer-Verlag London Ltd., part of Springer Nature.

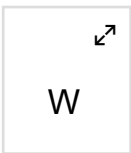
SciVal Topic Prominence

Topic: Electric discharge machining | Electric discharges | Electrode wear

Prominence percentile: 99.053

Chemistry database information

Substances



Author keywords

DEDM Dry EDM Dry WEDM DWEDM Micro dry wire EDM μ DWEDM

Indexed keywords

Engineering controlled terms: Capacitance Compressed air Electric discharges Machine tools Machining centers Scanning electron microscopy Wire

Engineering uncontrolled terms: DEDM Dry WEDM DWEDM Experimental methods Machining operations Multi-process machines Wire electrical discharge machining Wire -EDM

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- 1 Mohd Abbas, N., Solomon, D.G., Fuad Bahari, Md.
A review on current research trends in electrical discharge machining (EDM)

(2007) *International Journal of Machine Tools and Manufacture*, 47 (7-8), pp. 1214-1228. Cited 414 times.
doi: 10.1016/j.ijmachtools.2006.08.026

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- 2 Ahmad, M.
(2007) *An Experimental Investigation of Single and Multi-Tool Micro-Edm (master's Thesis)*
National University of Singapore, Singapore
- 3 Akkurt, A.
Surface properties of the cut face obtained by different cutting methods from AISI 304 stainless steel materials

(2009) *Indian Journal of Engineering and Materials Sciences*, 16 (6), pp. 373-384. Cited 16 times.
- 4 Alexander, C.K., Sadiku, M.N.O.
(2007) *Fundamentals of Electric Circuits*. Cited 392 times.
New York, US, McGraw-Hill Higher Education
- 5 Ali, M.Y., Hung, W.N.P.
Micromachining

(2017) *Comprehensive Materials Finishing*, 1-3, pp. 322-343. Cited 3 times.
<http://www.sciencedirect.com/science/book/9780128032497>
ISBN: 978-012803250-3; 978-012803249-7
doi: 10.1016/B978-0-12-803581-8.09156-6

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- 6 Ali, M.Y., Mohammad, A.S.
Experimental study of conventional wire electrical discharge machining for microfabrication

(2008) *Materials and Manufacturing Processes*, 23 (7), pp. 641-645. Cited 39 times.
doi: 10.1080/10426910802316492

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