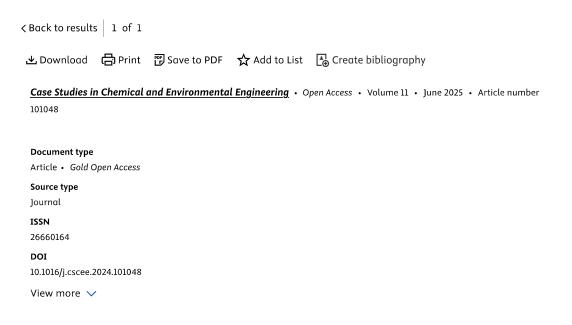
Scopus 20 | Empowering discovery since 2004





Prospect for pico-hydropower generation from 3D printed Polyethylene Terephthalate Glycol (PETG) Polymer: A Case Study in Pusu River, Malaysia

Abd Rahim, Nuranisa Suhada binti^a; Yang, Chuan Choong^a ; Sukindar, Nor Aiman^b Save all to author list

^a Department of Manufacturing and Materials Engineering, Faculty of Engineering, International Islamic University Malaysia, Kuala Lumpur, 50728, Malaysia

^b School of Design, Universiti Teknologi Brunei, Jalan Tungku Link Gadong, BE1410, Brunei Darussalam

Wiew PDF Full text options ∨ Export V

Abstract

Author keywords

Sustainable Development Goals

SciVal Topics

Metrics

Abstract

In Malaysia, rural communities rely on fossil fuel-powered generators for electrification. A small-scale Archimedean Screw Turbine (AST) can be utilized to generate pico-hydropower for potential clean energy generation. However, no study focuses on investigating the strength and torque of 3D printed AST with Polyethylene Terephthalate Glycol (PETG) polymer. Hence, the aim of this work is to investigate the mechanical strength and torque generation of 3D printed PETG AST through Ultimate Tensile Strength (UTS) test and experimental test. UTS test results show that 37.10MPa is the highest tensile strength obtained while 0.0195Nm is the optimum torque generated through AST experimental test. © 2024

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Related documents

Optimization of screw turbine design parameters to improve the power output and efficiency of micro-hydropower generation

Lamesgin, H.B., Ali, A.N. (2024) Cogent Engineering

Theoretical analysis of a small screw Archimedes turbine to obtain the best performance for use in Umm Qasr port

Hameed, S.H., Khalifa, M.Z., Hanfesh, A.O. (2024) AIP Conference Proceedings

Laboratory study of an Archimedes screw hydrokinetic turbine

Phillips, T.E., Wood, D.H. (2021) Proceedings of the European Wave and Tidal Energy Conference

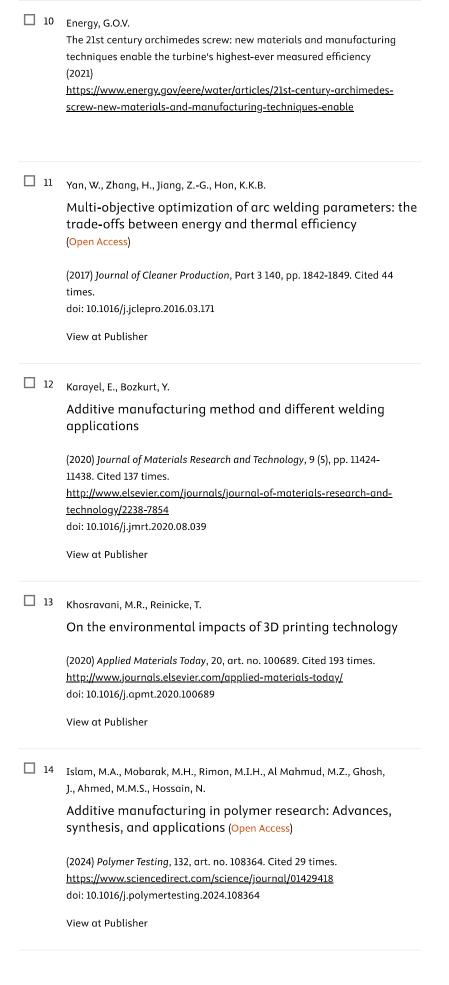
View all related documents based on references

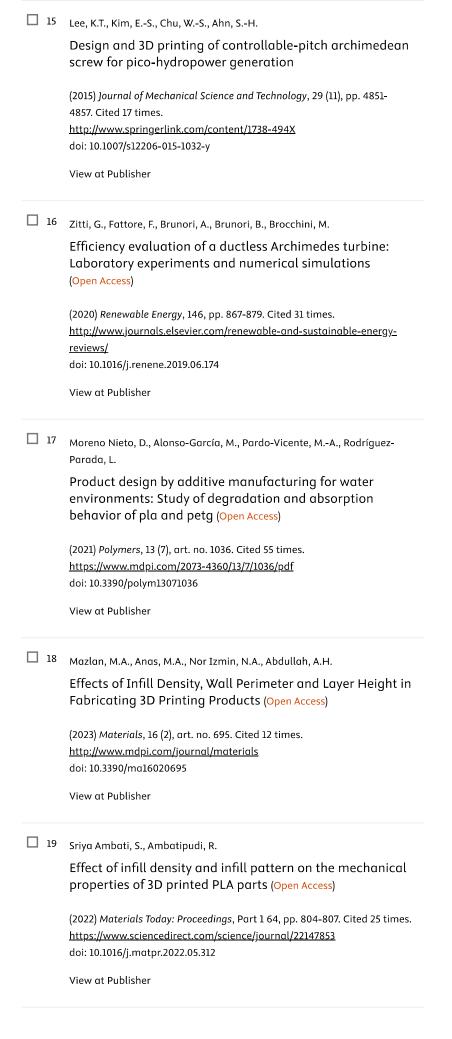
Find more related documents in Scopus based on:

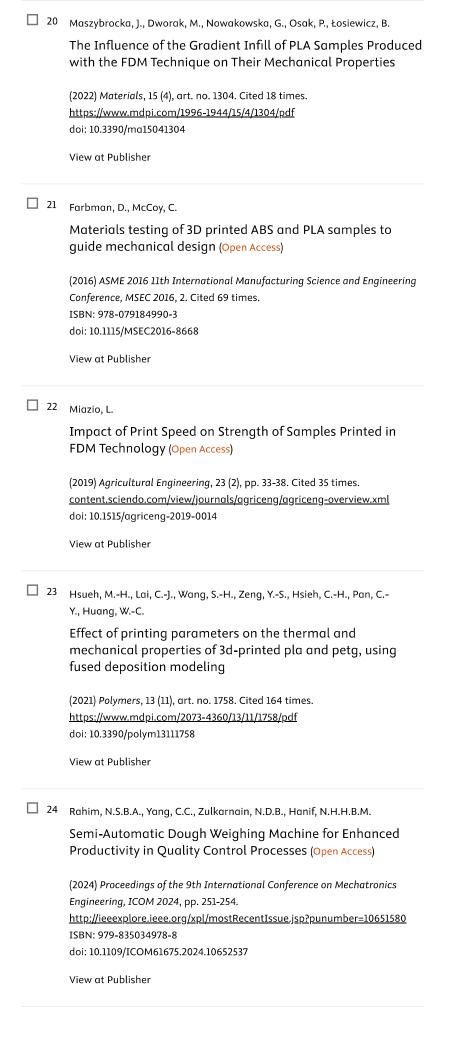
Authors > Keywords >

Author keyword 3D printing; Archin Torque generation	sedean screw turbine (AST); Polyethylene Terephthalate Glycol (PETG); Tensile strength;
Sustainable Devel	opment Goals ①
SciVal Topics (i)	~
Metrics	~
	References (34) View in search results format
	☐ All
	Export 🖨 Print 🖾 E-mail 📆 Save to PDF Create bibliography
	☐ 1 Julai, N., Yonis Buswig, Y.M. Hybrid Renewable System based Pumped Energy Storage for the Electrification of Rural Areas (2020) 2020 13th International UNIMAS Engineering Conference, EnCon 2020, art. no. 9299334. Cited 7 times. http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=9298901 ISBN: 978-172819293-2 doi: 10.1109/EnCon51501.2020.9299334 View at Publisher
	□ 2 Lee, M.D., Lee, P.S. Modelling the Energy Extraction from Low-Velocity Stream Water by Small Scale Archimedes Screw Turbine (2023) Journal of King Saud University - Engineering Sciences, 35 (5), pp. 319- 326. Cited 17 times. https://www.sciencedirect.com/journal/journal-of-king-saud-university-engineering-sciences doi: 10.1016/j.jksues.2021.04.006 View at Publisher
	Nguyen, T.T.H., Phan, G.Q., Tran, T.K., Bui, H.M. The role of renewable energy technologies in enhancing human development: Empirical evidence from selected countries (2023) Case Studies in Chemical and Environmental Engineering, 8, art. no. 100496. Cited 11 times. www.journals.elsevier.com/case-studies-in-chemical-and-environmental-engineering/doi: 10.1016/j.cscee.2023.100496 View at Publisher

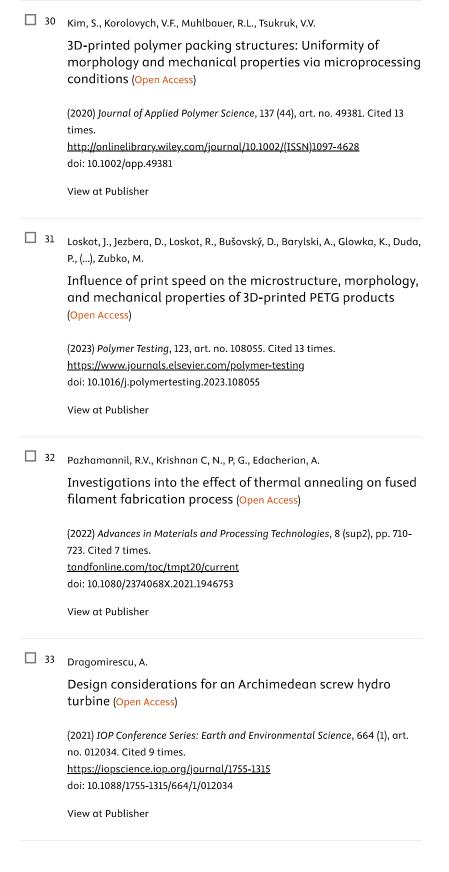
□ 4	YoosefDoost, A., Lubitz, W.D.
	Archimedes screw turbines: A sustainable development solution for green and renewable energy generation-a review of potential and design procedures
	(2020) Sustainability (Switzerland), 12 (18), art. no. 7352. Cited 63 times. https://res.mdpi.com/d_attachment/sustainability/sustainability-12-07352/article_deploy/sustainability-12-07352-v2.pdf doi: 10.3390/SU12187352
	View at Publisher
□ 5	Erinofiardi, Nuramal, A., Bismantolo, P., Date, A., Akbarzadeh, A., Mainil, A.K., Suryono, A.F.
	Experimental Study of Screw Turbine Performance based on Different Angle of Inclination
	(2017) Energy Procedia, 110, pp. 8-13. Cited 33 times. http://www.sciencedirect.com/science/journal/18766102 doi: 10.1016/j.egypro.2017.03.094
	View at Publisher
6	Syam, I., Maulana, M.I., Syuhada, A. Design and performance of archimedes single screw turbine as micro hydro power plant with flow rate debit variations (case study in air dingin, samadua - south aceh) (2019) Jurnal Inotera, 4 (1), p. 13. Cited 9 times.
7	Maulana, M.I., Syuhada, A., Kurniawan, R. Experimental study on the effect of flow rate on the performance of two-blade archimedes screw turbine (2019)
	https://semarakilmu.com.my/journals/index.php/fluid_mechanics_thermal_sciences/article/view/3483
8	Nagel, G. Archimedian Screw Pump Handbook: Fundamental Aspects of the Design and Operation of Water Pumping Installations Using Archimedian Screw Pumps (1968). Cited 34 times. RITZ-Pumpenfabrik OHG
9	Rahim, N.S.B.A., Yang, C.C., Mamat, N.F.N.B. Optimizing an archimedean screw turbine (AST) at low water flow velocity for clean energy generation, Proceeding of 6th International Conference on Advances in Manufacturing and Materials Engineering (ICAMME) 2024, Lecture Notes in Mechanical Engineering, Springer.







□ 25	Yang, C.C., Hanafi, N.F.R.B.N., Hanif, N.H.H.B.M., Ismail, A.F., Chang, HH. A novel non-intrusive vibration energy harvesting method for air conditioning compressor unit (Open Access) (2021) Sustainability (Switzerland), 13 (18), art. no. 10300. Cited 3 times. https://www.mdpi.com/2071-1050/13/18/10300/pdf
	doi: 10.3390/su131810300 View at Publisher
□ 26	Razali, F.A., Ayob, M.F. Appraisal of cost-effective approaches for the PUSU river rehabilitation (2022) J. Archit. Plan. Construct. Manag., 12 (2), pp. 40-57.
□ 27	A, S., S, R.K., Aljafari, B., Thanikanti, S.B. Investigations of the performance of 3D printed micro wind turbine composed of PLA material (Open Access) (2024) Heliyon, 10 (3), art. no. e25356. https://www.sciencedirect.com/science/journal/24058440 doi: 10.1016/j.heliyon.2024.e25356 View at Publisher
28	Sukindar, N.A., Shaharuddin, S.I.S., Kamruddin, S., Azhar, A.Z.A., Yang, C.C. Comparison study on mechanical properties of 3D printed PLA and pla/aluminium composites using fused deposition modeling technique (2022) https://malaysianjournalofmicroscopy.org/ojs/index.php/mjm/article/view/541
□ 29	Karad, A.S., Sonawwanay, P.D., Naik, M., Thakur, D.G. Experimental study of effect of infill density on tensile and flexural strength of 3D printed parts (Open Access) (2023) Journal of Engineering and Applied Science, 70 (1), art. no. 104. Cited 8 times. https://www.springer.com/journal/44147 doi: 10.1186/s44147-023-00273-x View at Publisher



	□ 34	Waters, S., Aggidis, G.A.	
		Over 2000 years in review: Revival of the Archimedes Scr from Pump to Turbine (Open Access)	ew
		(2015) Renewable and Sustainable Energy Reviews, 51, pp. 497-505. Cited times.	65
		https://www.journals.elsevier.com/renewable-and-sustainable-energy-reviews	=
		doi: 10.1016/j.rser.2015.06.028	
		View at Publisher	
	Engineer	C.C.; Department of Manufacturing and Materials Engineering, Faculty ing, International Islamic University Malaysia, Kuala Lumpur, Malaysia; ngcc@iium.edu.my	
	© Copyr	ight 2024 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

日本語版を表示する

查看简体中文版本

查看繁體中文版本

Просмотр версии на русском языке

Customer Service

Help

Tutorials

Contact us

ELSEVIER

Terms and conditions abla Privacy policy abla Cookies settings

All content on this site: Copyright © 2025 Elsevier B.V. \neg , its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the relevant licensing terms apply. We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies \neg .

RELX™