

# The select of internal architecture for porous Ti alloy scaffolds: the effect of pore size on the mechanical properties and permeability

Materials and Design

192, 108754

DOI: [10.1016/j.matdes.2020.108754](https://doi.org/10.1016/j.matdes.2020.108754)

Citation Report

#	ARTICLE	IF	CITATIONS
1	Microstructural features and compressive properties of SLM Ti6Al4V lattice structures. Surface and Coatings Technology, 2020, 403, 126419.	4.8	47
2	Structural and Material Determinants Influencing the Behavior of Porous Ti and Its Alloys Made by Additive Manufacturing Techniques for Biomedical Applications. Materials, 2021, 14, 712.	2.9	37
3	Functional repair of critically sized femoral defects treated with bioinspired titanium gyroid-sheet scaffolds. Journal of the Mechanical Behavior of Biomedical Materials, 2021, 116, 104380.	3.1	24
4	Mechanical properties and fluid permeability of gyroid and diamond lattice structures for intervertebral devices: functional requirements and comparative analysis. Science and Technology of Advanced Materials, 2021, 22, 285-300.	6.1	29
5	Biomorphic porous Ti6Al4V gyroid scaffolds for bone implant applications fabricated by selective laser melting. Progress in Additive Manufacturing, 2021, 6, 455-469.	4.8	19
6	Microstructure and compressive properties of Al <sub>6</sub> Si <sub>10</sub> Mg lattice structures manufactured using selective laser melting. Materialwissenschaft Und Werkstofftechnik, 2021, 52, 762-771.	0.9	2
7	Mechanical and energy absorption properties of functionally graded lattice structures based on minimal curved surfaces. International Journal of Advanced Manufacturing Technology, 2022, 118, 995-1008.	3.0	17
8	Effects of porosity gradient pattern on mechanical performance of additive manufactured Ti-6Al-4V functionally graded porous structure. Materials and Design, 2021, 208, 109911.	7.0	30
9	Biodegradable ZnLiCa ternary alloys for critical-sized bone defect regeneration at load-bearing sites: In vitro and in vivo studies. Bioactive Materials, 2021, 6, 3999-4013.	15.6	40
10	Surface treatment of 3D printed Cu-bearing Ti alloy scaffolds for application in tissue engineering. Materials and Design, 2022, 213, 110350.	7.0	13
11	Spray-deposited Ag nanoparticles on micro/nano structured Ti6Al4V surface for enhanced bactericidal property and cytocompatibility. Surface and Coatings Technology, 2022, 431, 128010.	4.8	9
12	Topological design, mechanical responses and mass transport characteristics of high strength-high permeability TPMS-based scaffolds. International Journal of Mechanical Sciences, 2022, 217, 107023.	6.7	27
13	Manufacturing of porous titanium using friction stir welding. Materials Letters, 2022, 310, 131430.	2.6	3
14	Challenges in computational fluid dynamics applications for bone tissue engineering. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2022, 478, 20210607.	2.1	6
15	Effect of Surface Curvature on the Mechanical and Mass-Transport Properties of Additively Manufactured Tissue Scaffolds with Minimal Surfaces. ACS Biomaterials Science and Engineering, 2022, 8, 1623-1643.	5.2	12
16	Triply periodic minimal surface (TPMS) porous structures: from multi-scale design, precise additive manufacturing to multidisciplinary applications. International Journal of Extreme Manufacturing, 2022, 4, 022001.	12.7	139
17	Surface functionalization of 3D printed Ti scaffold with Zn-containing mesoporous bioactive glass. Surface and Coatings Technology, 2022, 435, 128236.	4.8	14
18	Ultra-high specific strength Ti6Al4V alloy lattice material manufactured via selective laser melting. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2022, 840, 142956.	5.6	14

#	ARTICLE	IF	CITATIONS
19	On the design evolution of hip implants: A review. <i>Materials and Design</i> , 2022, 216, 110552.	7.0	60
20	Biomedical porous scaffold fabrication using additive manufacturing technique: Porosity, surface roughness and process parameters optimization. <i>International Journal of Lightweight Materials and Manufacture</i> , 2022, 5, 384-396.	2.1	8
21	Multi-objective Shape Optimization of Bone Scaffolds: Enhancement of Mechanical Properties and Permeability. <i>Acta Biomaterialia</i> , 2022, 146, 317-340.	8.3	18
22	Application of finite element analysis for optimizing selection and design of Ti-based biometallic alloys for fractures and tissues rehabilitation: a review. <i>Journal of Materials Research and Technology</i> , 2022, 19, 121-139.	5.8	8
23	Anisotropic mechanical and mass-transport performance of Ti6Al4V plate-lattice scaffolds prepared by laser powder bed fusion. <i>Acta Biomaterialia</i> , 2022, 148, 374-388.	8.3	13
24	Pore Strategy Design of a Novel NiTi-Nb Biomedical Porous Scaffold Based on a Triply Periodic Minimal Surface. <i>Frontiers in Bioengineering and Biotechnology</i> , 0, 10, .	4.1	12
25	Osteoimmunityâ€Regulating Biomimetically Hierarchical Scaffold for Augmented Bone Regeneration. <i>Advanced Materials</i> , 2022, 34, .	21.0	90
26	Additive manufacturing of functionally graded porous titanium scaffolds for dental applications. , 2022, 139, 213018.		13
27	Self-lubricating coating design strategy for titanium alloy by additive manufacturing. <i>Applied Surface Science</i> , 2022, 602, 154333.	6.1	7
28	Structural design and performance study of primitive triply periodic minimal surfaces Ti6Al4V biomimetic scaffold. <i>Scientific Reports</i> , 2022, 12, .	3.3	1
29	Ti6Al4V orthopedic implant with biomimetic heterogeneous structure via 3D printing for improving osteogenesis. <i>Materials and Design</i> , 2022, 221, 110964.	7.0	11
30	Geometry-Based Computational Fluid Dynamic Model for Predicting the Biological Behavior of Bone Tissue Engineering Scaffolds. <i>Journal of Functional Biomaterials</i> , 2022, 13, 104.	4.4	9
31	Effect of laser scanning speed on microstructure and mechanical properties of SLM porous Ti-5Al-5V-5Mo-3Cr-1Fe alloy. <i>Frontiers in Materials</i> , 0, 9, .	2.4	1
32	Structure-property relationships of imperfect additively manufactured lattices based on triply periodic minimal surfaces. <i>Materials and Design</i> , 2022, 222, 111036.	7.0	8
33	Self-lubricating coating with zero weight loss performance on additively manufactured Ti-6Al-4V. <i>Surface and Coatings Technology</i> , 2022, 447, 128847.	4.8	4
34	Biomechanical behavior of customized scaffolds: A three-dimensional finite element analysis. <i>Materials and Design</i> , 2022, 223, 111173.	7.0	4
35	DESIGNING OF DIFFERENT TYPES OF GYROID SCAFFOLD ARCHITECTURE TO ACHIEVE PATIENT-SPECIFIC OSSEOINTEGRATION FRIENDLY MECHANICAL ENVIRONMENT. <i>International Journal for Multiscale Computational Engineering</i> , 2023, 21, 1-15.	1.2	2
36	Study on bioactivity of SLMed variable gradient TC4 biomedical porous scaffolds with micro-arc oxidation treatment. <i>Anti-Corrosion Methods and Materials</i> , 2022, 69, 660-666.	1.5	6

#	ARTICLE	IF	CITATIONS
37	Relationship between the Composition and Elastic Modulus of TiZrTa Alloys for Implant Materials. Metals, 2022, 12, 1582.	2.3	2
38	Modular-based gradient scaffold design and experimental studies for tissue engineering: enabling customized structures and mechanical properties. Journal of Materials Science, 0, , .	3.7	0
39	Structural Design and Mechanical Properties Analysis of Fused Triply Periodic Minimal Surface Porous Scaffold. Journal of Materials Engineering and Performance, 2023, 32, 4083-4096.	2.5	2
40	Mechanical Characterisation and Numerical Modelling of TPMS-Based Gyroid and Diamond Ti6Al4V Scaffolds for Bone Implants: An Integrated Approach for Translational Consideration. Bioengineering, 2022, 9, 504.	3.5	14
41	Optimal microstructure and mechanical properties of open-cell porous titanium structures produced by selective laser melting. Frontiers in Bioengineering and Biotechnology, 0, 10, .	4.1	1
42	Mechanical and permeability properties of porous scaffold developed by Voronoi tessellation for bone tissue engineering. Journal of Materials Chemistry B, 0, , .	5.8	3
43	Wall Shear Stress Analysis and Optimization in Tissue Engineering TPMS Scaffolds. Materials, 2022, 15, 7375.	2.9	3
44	Gyroid-based functionally graded porous titanium scaffolds for dental application: Design, simulation and characterizations. Materials and Design, 2022, 224, 111300.	7.0	12
45	Wide-range tuning of the mechanical properties of TPMS lattice structures through frequency variation. Materials and Design, 2022, 224, 111370.	7.0	3
46	Design of bone-like continuous gradient porous scaffold based on triply periodic minimal surfaces. Journal of Materials Research and Technology, 2022, 21, 3650-3665.	5.8	15
47	Investigating mechanical and biological properties of additive manufactured Ti6Al4V lattice structures for orthopedic implants. Journal of Materials Research, 2023, 38, 507-518.	2.6	2
48	Design, printing, and engineering of regenerative biomaterials for personalized bone healthcare. Progress in Materials Science, 2023, 134, 101072.	32.8	32
49	Auxetic metamaterials for bone-implanted medical devices: Recent advances and new perspectives. European Journal of Mechanics, A/Solids, 2023, 98, 104905.	3.7	18
50	Enhancement in the fatigue resistances of triply periodic surfaces-based scaffolds. International Journal of Mechanical Sciences, 2023, 245, 108119.	6.7	9
51	Gradient scaffolds developed by parametric modeling with selective laser sintering. International Journal of Mechanical Sciences, 2023, 248, 108221.	6.7	9
52	Compressive behavior and property prediction of gradient cellular structures fabricated by selective laser melting. Materials Today Communications, 2023, 35, 105853.	1.9	3
53	The ordered nanoporous CrFe alloy with rapid strain hardening ability. Journal of Materials Research and Technology, 2023, 24, 1679-1691.	5.8	0
54	Corrosion fatigue behavior of porous Cu-bearing Ti alloy fabricated by selective laser melting. Journal of Materials Research and Technology, 2023, 23, 1630-1643.	5.8	5

#	ARTICLE	IF	CITATIONS
55	Research progress on the design and performance of porous titanium alloy bone implants. Journal of Materials Research and Technology, 2023, 23, 2626-2641.	5.8	28
56	Numerical Simulation and Experimental Study of Porous Titanium Implants under Compressive Loading Conditions. Journal of Materials Engineering and Performance, 0, , .	2.5	0
57	Bioceramic scaffolds with triply periodic minimal surface architectures guide early-stage bone regeneration. Bioactive Materials, 2023, 25, 374-386.	15.6	13
58	Additive manufacturing of titanium-based lattice structures for medical applications â€” A review. Bioprinting, 2023, 30, e00267.	5.8	10
59	Enhanced Osteogenic Properties of Bone Repair Scaffolds through Synergistic Effects of Mechanical and Biochemical Stimulation. Advanced Engineering Materials, 2023, 25, .	3.5	0
60	Multiscale Homogenization Techniques for TPMS Foam Material for Biomedical Structural Applications. Bioengineering, 2023, 10, 515.	3.5	1
61	Plate lattice metamaterials. , 2023, , 267-323.		0
62	Manufacturability and Mechanical Assessment of Ti-6Al-4V 3D Printed Structures for Patient-Specific Implants. Iranian Journal of Science and Technology - Transactions of Mechanical Engineering, 2024, 48, 397-409.	1.3	0
63	Bio-inspired design, mechanical and mass-transport characterizations of orthotropic TPMS-based scaffold. Composite Structures, 2023, 321, 117256.	5.8	3
64	Shape optimization of additively manufactured lattices based on triply periodic minimal surfaces. Additive Manufacturing, 2023, , 103659.	3.0	0
65	Research Progress on Mechanical Properties of 3D Printed Biomedical Titanium Alloys. Journal of Materials Engineering and Performance, 0, , .	2.5	0
66	Determination of Optimum Design Parameters for Gyroid Scaffolds to Mimic a Real Bone-Like Condition In Vitro: A Fluid Structure Interaction Study. Journal of Engineering and Science in Medical Diagnostics and Therapy, 2023, 6, .	0.5	0
67	Development and characterizations of graded porous titanium scaffolds via selective laser melting for orthopedics applications. Transactions of Nonferrous Metals Society of China, 2023, 33, 1755-1767.	4.2	3
68	Mechanical influence of tissue scaffolding design with different geometries using finite element study. Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine, 2023, 237, 1008-1016.	1.8	1
69	Mechanical Properties Directionality and Permeability of Fused Triply Periodic Minimal Surface Porous Scaffolds Fabricated by Selective Laser Melting. ACS Biomaterials Science and Engineering, 2023, 9, 5084-5096.	5.2	2
70	Experimental and numerical characterization of imperfect additively manufactured lattices based on triply periodic minimal surfaces. Materials and Design, 2023, 233, 112197.	7.0	2
71	Radial gradient design enabling additively manufactured low-modulus gyroid tantalum structures. International Journal of Mechanical Sciences, 2024, 262, 108710.	6.7	3
72	Investigating the fatigue behavior of 3D-printed bone scaffolds. Journal of Materials Science, 2023, 58, 12929-12953.	3.7	0

#	ARTICLE	IF	CITATIONS
73	Design and Geometric Characterization of Three-Dimensional Gradient Heterogeneous Bone Tissue Structures Based on Voronoi. Science of Advanced Materials, 2023, 15, 561-570.	0.7	0
74	Static compression and fatigue behavior of heat-treated selective laser melted titanium alloy (Ti6Al4V) gyroid cylinders. Journal of the Mechanical Behavior of Biomedical Materials, 2023, 146, 106076.	3.1	1
75	Design and evaluation of TPMS-inspired 3D-printed scaffolds for bone tissue engineering: Enabling tailored mechanical and mass transport properties. Composite Structures, 2024, 327, 117638.	5.8	1
76	Preliminary exploration of the biomechanical properties of three novel cervical porous fusion cages using a finite element study. BMC Musculoskeletal Disorders, 2023, 24, .	1.9	0
77	Effect of the lattice structure on the interface zone and the final properties of novel PrintCast Ti64-4Si9Cu3 interpenetrating phase composites. Additive Manufacturing, 2024, 79, 103902.	3.0	0
78	Mechanical Performance of a Node-Reinforced Body-Centered Cubic Lattice Structure: An Equal-Strength Concept Design. Aerospace, 2024, 11, 4.	2.2	0
79	Mechanical, electrochemical and permeability behaviour of Ti6Al4V scaffolds fabricated by electron beam powder bed fusion for orthopedic implant applications: The role of cell type and cell size. Journal of Materials Research and Technology, 2024, 28, 3240-3257.	5.8	0
80	Multi-objective optimization for designing porous scaffolds with controllable mechanics and permeability: A case study on triply periodic minimal surface scaffolds. Composite Structures, 2024, 333, 117923.	5.8	1
81	Processing of Porous-Core Materials for Bone Implant Applications: A Permeability and Mechanical Strength Analysis. Coatings, 2024, 14, 65.	2.6	0
83	Unidirectional titanium fiber-reinforced porous titanium with mechanical properties suitable for load-bearing biomaterials. Journal of the Mechanical Behavior of Biomedical Materials, 2024, 151, 106388.	3.1	0
84	Bamboo-Inspired Porous Scaffolds for Advanced Orthopedic Implants: Design, Mechanical Properties, and Fluid Characteristics. ACS Biomaterials Science and Engineering, 2024, 10, 1173-1189.	5.2	0
85	Mechanical and permeability properties of skeletal and sheet triply periodic minimal surface scaffolds in bone defect reconstruction. Results in Engineering, 2024, 21, 101883.	5.1	1
86	Analysis of TPMS Based on TPMS for Bone Scaffold. Lecture Notes in Bioengineering, 2023, , 59-67.	0.4	0
87	Effect of 3D-Printed Porous Titanium Alloy Pore Structure on Bone Regeneration: A Review. Coatings, 2024, 14, 253.	2.6	0
88	Fabrication of 3D printed trabecular bone-templated scaffolds modified with rare earth europium (III)-based complex for enhancing mitochondrial function in bone regeneration. Applied Materials Today, 2024, 37, 102130.	4.3	0
89	Characterization of additively manufactured lumbar interbody fusion cages based on triply periodic minimal surfaces. Materials Today Communications, 2024, 39, 108634.	1.9	0