

Freemelt Publications

2024				
Title	Focus	Freemelt user	Country	Link to buplication
Gum metal (TNTZ)	Ti-35.5Nb-2Ta-3Zr	Bergische Universität Wuppertal	Germany	Powder Bed Fusion - Electron Beam of an oxygen-compatible β-TNTZ (Ti-35.5Nb-2Ta-3Zr) alloy: Feasibility and Material Evaluation
Steel	ER70S-6 steel	Carnegie Mellon University	United States	Trajectory Optimization for Spatial Microstructure Control in Electron Beam Metal Additive Manufacturing
Steel	316L stainless steel	Carnegie Mellon University	United States	ADDOPT: An Additive Manufacturing Optimal Control Framework Demonstrated in Minimizing Layer-Level Thermal Variance in Electron Beam Powder Bed Fusion
Ni-base SX superalloy	CMSX-4	FAU Erlangen-Nürnberg	Germany	Multiple interaction electron beam powder bed fusion for controlling melt pool dynamics and improving surface quality
Titanium alloy	Ti-6Al-4V	FAU Erlangen-Nürnberg	Germany	Correlating outgassing and smoke phenomenon in electron beam powder bed fusion of Ti6Al4V using a residual gas analyzer
Shape-memory alloy	NiTi	FAU Erlangen-Nürnberg	Germany	Anisotropic Superelastic and Shape Memory Effect of Nitinol Manufactured by Electron Beam Powder Bed Fusion
Steel composite	TiC/Steel	FAU Erlangen-Nürnberg	Germany	Additive Manufacturing of TiC/Steel Composites Using Electron Beam Melting and In Situ Infiltration
Soft magnetic alloy	Fe93.5Si6.5	FAU Erlangen-Nürnberg	Germany	Correlation Between Structural Features and Magnetic Performance of Fe93.5Si6.5 (wt.%) Soft Magnetic Materials
Titanium and Ni-base SX superalloy	Ti-6Al-4V and CMSX-4	FAU Erlangen-Nürnberg, KTH Royal Institute of Technology, Helmholtz-Zentrum Hereon	Germany, Sweden	Revealing the Mechanisms of Smoke during Electron Beam–Powder Bed Fusion by High-Speed Synchrotron Radiography
Shape-memory alloy	NiTi	FAU Erlangen-Nürnberg, Technische Universität Dortmund	Germany	Thermo-mechanical Study on Auxetic Shape Memory Periodic Open Cellular Structures—Part II: Mechanical and Shape Memory Properties
Precipitation-hardened copper	CuCrZr	Politecnico di Torino	Italy	CuCrZr alloy obtained via electron-beam powder bed fusion: Microstructural insights and precipitation behaviour
Copper alloys	pure Cu and CuNi2SiCr	Politecnico di Torino	Italy	Optimization of additive manufacturing processes for copper and its alloys
Copper	Pure Cu	Ruhr-Universität Bochum, Bergische Universität Wuppertal	Germany	Powder bed fusion of pure copper using an electron beam – achieving high conductivity by real-time process monitoring and control
Copper-chromium composite	Cu-25Cr	University Grenoble Alpes	France	Microstructure Evolutions Induced by Electron Beam Melting of a Sintered Cu-25Cr Composite
Aluminium alloy	Al-4Mn-3Ni-2Cu-1Zr	University Grenoble Alpes	France	Microstructure Formation of a New Al-4Mn-3Ni-2Cu-1Zr Aluminium Alloy During Electron Beam Powder Bed Fusion
Refractory ceramics	NbC	University of Linköping	Sweden	Feasibility of Melting NbC Using Electron Beam Powder Bed Fusion
Refractory ceramics	TiB ₂	University of Linköping, Bergische Universität Wuppertal	Sweden, Germany	In-melt electron analysis to accelerate process exploration of ceramics: Electron beam melting of TiB₂
Steel	SS 316L	University of North Texas	United States	Electron Beam Additive Manufacturing of SS316L with a Stochastic Scan Strategy: Microstructure, Texture Evolution, and Mechanical Properties
Ni-base superalloy	In718	University of Texas at El Paso	United States	Comparative Study Of Hydrogen Embrittlement On Ebm Inconel 718 As-Built And Hiped Specimens
Ni-base superalloy	In718	University of Texas at El Paso, University of Arizona	United States	Microstructure Refinement of Bulk Inconel 718 Parts During Fabrication with EB-PBF Using Scanning Strategies: Transition from Bidirectional-Raster to Stochastic Point-Based Melting

2025				
Title	Focus	Freemelt user	Country	Link to buplication
Powder bed fusion electron beam of an oxygen-compatible β -Ti–35.5Nb–2Ta–3Zr alloy: Feasibility and material evaluation	β -Ti–35.5Nb–2Ta–3Zr alloy	Bergische Universität Wuppertal	Germany	https://www.randfonline.com/doi/full/10.1080/26889277.2024.2448120#abstract
An Additive Manufacturing Optimal Control Framework Demonstrated in Minimizing Layer-Level Thermal Variance in Electron Beam Powder Bed Fusion	Thermal variation	Carnegie Mellon	United States	https://asmedigitalcollection.asme.org/manufacturingscience/article-e-abstract/147/4/041009/1210223/ADDOPT-An-Additive-Manufacturing-Optimal-Control
Aluminium alloy	Al-4Mn-3Ni-2Cu-1Zr	University Grenoble Alpes	France	Microstructure formation of a new Al-4Mn-3Ni-2Cu-1Zr Aluminium alloy during Electron Beam Powder Bed Fusion - ScienceDirect
Molybdenum	Molybdenum	Politecnico di Torino	Italy	https://www.sciencedirect.com/science/article/abs/pii/S0263436825000563
Molybdenum	Molybdenum	Politecnico di Torino	Italy	https://www.sciencedirect.com/science/article/pii/S258915292500110
Stainless Steel	316L	Linköping University	Sweden	https://www.sciencedirect.com/science/article/pii/S0264127525025767via%3Dihub
Molybdenum	Mo-Si-B (Mo-9Si-8B)	FAU Erlangen	Germany	https://link.springer.com/article/10.1007/s40964-025-01119-z
Single crystal twisting in additive manufacturing	CMSX-4	FAU Erlangen	Germany	https://link.springer.com/article/10.1007/s40964-025-01158-6
Real-time X-ray characterization of Electron Beam Powder Bed Fusion (E-PBF)		KTH Royal Institute of Technology	Sweden	https://kth.diva-portal.org/smash/record.jsf?pid=diva2%3A1957938&dsid=4652
PBF-EB process development of chemically reduced tungsten	W	Mid Sweden University, UPC Barcelona, Sandvik, Wolfram	Sweden, Spain, Netherlands	https://link.springer.com/article/10.1007/s40964-025-01312-0
In-situ synchrotron imaging of powder consolidation and melt pool dynamics in E-PBF	Nickel-base superalloy CMSX-4	FAU Erlangen-Nürnberg, KTH Royal Institute of Technology, Helmholtz-Zentrum Hereon	Sweden, Germany	https://www.sciencedirect.com/science/article/pii/S221486042503070
Powder bed fusion of pure copper using an electron beam: a comparative study on the material properties obtained using vector- and spot-based exposure	Pure copper	Ruhr University Bochum	Sweden, Germany	https://link.springer.com/article/10.1007/s40964-025-01344-6?utm_source=rct_congratemail&utm_medium=email&utm_campaign=oa_20250924&utm_content=10.1007%2Fs40964-025-01344-6
In situ recrystallization of pure Cu during Electron Beam Powder Bed Fusion	Pure copper	University Grenoble Alpes	France	https://www.sciencedirect.com/science/article/pii/S2772369025000623
Microstructure and thermal stability of oxidized copper produced by electron beam powder bed fusion	Pure copper	Linköping University	Sweden	https://www.sciencedirect.com/science/article/pii/S2238785425024494
Assessing the effect of scan strategies on the structure-property relationship in electron beam powder bed fusion processed 316L stainless steel		Linköping University	Sweden	https://www.sciencedirect.com/science/article/pii/S026412752502576
7 - E-PBF-based additive manufacturing of shape memory alloys	shape memory alloys (SMA)	University of Kassel, Kassel, Germany		https://www.sciencedirect.com/science/chapter/edited-volume/abs/pii/B978043295842000080?via%3Dihub
Evaluation of Different Dynamic Point Melt Scanning Strategies on Microstructure Evolution for IN718 Bulk Parts Fabricated by EB-PBF	Inconel 718	The University of Texas at El Paso, University of Arizona	United States	https://www.sciencedirect.com/science/article/pii/S2238785425028819
A comprehensive in-situ monitoring framework for pore and uneven surface detection in electron beam powder bed fusion via electron-optical imaging	in-situ monitoring	Texas A&M University and Prairie View A&M University	United States	https://www.sciencedirect.com/science/article/abs/pii/S1526612525012873