

本出版物被SCI收录

ISSN1002-185X

CODEN XJCGEA

稀有金属材料与工程

RARE METAL MATERIALS AND ENGINEERING



2018年3月
第47卷

3

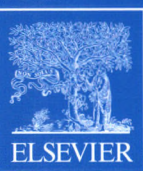


中国有色金属学会
中国材料研究学会
西北有色金属研究院

主 办

科 学 出 版 社

出 版



RARE METAL MATERIALS AND ENGINEERING

This publication is covered in SCI Expanded®, Research Alert®, and Materials Science Citation Index®
Monthly, International Scholarly Journal, ISSN 1002-185X Vol. 47 No. 3 Sum 380 March 2018

CONTENTS

Materials Science

Simulation of Electrodepositing Process Based on Supercritical Fluid and
Test Research.....Qian Haifeng, Lei Weining, Liu Weiqiao *et al* (717)

Corrosion Behavior of W-Mo Co-Penetrated Layer Produced by Glow
Discharge Plasma Technique in Acid Solution
.....Chen Fei, Zhang Yulin, Liu Weiguang *et al* (723)

Influence of Mn Doping on the Electronic Structure and Absorption Spectrum
of Ca₂SiO₄:Eu²⁺ Phosphor
.....Chen Haitao, Huang Xuefei, Huang Weigang (729)

Microstructure and Mechanical Properties of AZ31B Magnesium Alloy Prepared
by Solid State Recycling.....Wu Shuyan, Ji Zesheng, Hu Ming *et al* (736)

Effect of Sr Modification on Microstructures and Mechanical Properties of
Al₃Ti/ADC₁₂ Composites.....Wu Qingjie, Yan Hong, Liu Yuan *et al* (742)

A Simple and Effective Process to Join Coated Superconductors at a Low
Resistance.....Zhang Han, Ma Guangtong, Li Xingtian *et al* (748)

Effect of Catalysts on Hydrolysis Hydrogen Release of Sodium Borohydride
.....Zheng Xueping, Guo Maowen, Liu Chunrong *et al* (754)

Surface Metallization of SiC Ceramic by Mo-Ni-Si Coatings for Improving
Its Wettability by Molten Ag
.....Zhao Santuan, Zhang Xiangzhao, Liu Guiwu *et al* (759)

Effect of Processing Parameters on Gelcasting Process for Mo/Cu Powders
.....Duan Bohua, Qi Chengkang, Wang Dezhi *et al* (766)

Influence of Hot Extrusion and Aging Treatment on the Properties of
Biodegradable Mg-Zn-Y Alloy
.....Qiao Xueyan, Yu Kun, Chen Liangjian *et al* (773)

Structure and Mechanical Property of Friction-Stir Weld Joint of 2195-T8 Al-Li
Alloy Plate.....Li Jinfeng, Chen Yonglai, Zhang Xuhu *et al* (780)

Effects of Ti Sheet Insert on Microstructure and Properties of Graded Composites
of TiB₂-based Ceramic and Ti-6Al-4V Alloy
.....Chen Shuo, Zhao Zhongmin, Zhang Long *et al* (788)

Correlation Between Microstructure and Corrosion Behavior of Zr-0.8Sn-1Nb-0.3Fe
Alloy.....Yang Zhongbo, Cheng Zhuqing, Qiu Jun *et al* (794)

Strength Stability of Aging Hardened Mg-10Y-1.5Sm Alloy
.....Zhang Qing, Chen Jun, Li Quanan (799)

This Journal is covered in SCI Expanded®, Research Alert®, Materials Science Citation Index® (MSCI); Engineering Index (EI); Chemical Abstracts (CA); Abstracts Journal (AJ); INSPEC; JICST; Cambridge Scientific Abstracts (CSA); Metals Abstracts (MA); World Aluminum Abstracts; Chinese Scientific and Technical Papers and Citations (CSTPC); Chinese Science Citation Index (CSCI).

Administrated by China Association for Science and Technology
Sponsored by Northwest Institute for Nonferrous Metal Research, the Nonferrous Metals Society of China, Chinese Materials Research Society
Published by Science Press
(16 Donghuangchenggen North Street, Beijing 100717, China)
Edited by Rare Metal Materials and Engineering Press
Editor in Chief: Zhang Pingxiang

Address: P. O. Box 51, Xi'an, Shaanxi, 710016, China
Tel: 0086-29-86231117
Fax: 0086-29-86231103
http: //www.rmme.ac.cn
E-mail: rmme@c-nin.com

Overseas Distributor: China International Book Trade Corporation (P. O. Box 399, Beijing 100048, China)
Overseas Annual Subscription Rate: USD300

RARE METAL MATERIALS AND ENGINEERING

This publication is covered in SCI Expanded®, Research Alert®, and Materials Science Citation Index®
Monthly, International Scholarly Journal, ISSN 1002-185X Vol. 47 No. 3 Sum 380 March 2018

Effects of Ti on Microstructure and High Temperature Mechanical Properties of High-boron Steel	
.....	Chen Xiang, Li Yanxiang, Wang Zhisheng <i>et al</i> (803)
Hot Deformation Behavior of New High Strength and Toughness Titanium Alloy	
.....	Wang Zhe, Wang Xinnan, Shang Guoqiang <i>et al</i> (810)
Fracture Behavior of the New β Ta-TiAl Alloy During the Hot Deformation	
.....	Luo Yuanyuan, Mao Xiaonan, Wu Jinping <i>et al</i> (816)
Nanoindentation Size Effect of Molybdenum-Niobium Single Crystals with Different Crystallographic Orientations	
.....	Zhang Wen, Zhang Pingxiang, Gao Xuanqiao <i>et al</i> (822)
Spall Microstructure Characteristics and Fracture Mechanism of Ti-6Al-4V and Ti-47Nb Alloys under Dynamic High-pressure Loading	
.....	Liu Hui, Yu Xiaodong, Tan Chengwen <i>et al</i> (829)
Modeling of the Critical Conditions on Dynamic Recrystallization for TiAl-based Alloy	
.....	Wan Zhipeng, Sun Yu, Hu Lianxi <i>et al</i> (835)
Interface Reactions Between DD6 Single Crystal Superalloy and Al ₂ O ₃ Molds	
.....	Yao Jiansheng, Li Xin, Wang Lili <i>et al</i> (840)
First-principles Study of Mechanical Properties and Electronic Structures of the Nickel-molybdenum Binary Compounds Under Pressure	
.....	Wang Juan, Hou Hua, Zhao Yuhong <i>et al</i> (846)
Molecular Dynamics Simulation of Nano Single Crystal Gamma-TiAl Alloy Strain Rate Effect	
.....	Luo Dechun, Zhang Ling, Fu Rong <i>et al</i> (853)
Effect of Al, Ti Contents on the Microstructure and Corrosion Resistance of As-forged Incoloy825 Alloy	
.....	Sun Nan, Wen Chen, Liu Zili <i>et al</i> (860)
Thermal Fatigue Damage of Tungsten Under High Heat Load	
.....	Ma Dong, Wang Bo, Wang Liang <i>et al</i> (867)
Micro-alloying Effects of Mn in 2297 Al-Li Alloy	
.....	Sang Fengjian, Zheng Ziqiao, Wang Haijin (871)
Deformation Characteristic and Microstructure Evolution of Spray Formed GH738 Alloy	
.....	Wang Yue, Xu Wenyong, Liu Na <i>et al</i> (878)
Microstructure Model of AZ31 Magnesium Alloy Based on Cellular Automaton	
.....	Chu Zhibing, Zhang Duo, Jiang Lianyun <i>et al</i> (884)
Research and Comparison on Precipitated Phases of High Mo Super Austenitic Stainless Steel and Ni-Cr-Mo Nickel-base Alloy	
.....	Song Zhigang, Xu Changzheng, Pu Enxiang <i>et al</i> (895)
Stress Corrosion Behavior and Cracking Mechanism of 2205 Duplex Stainless Steel in Acidic H ₂ S Environment	
.....	Yang Shizhou, Li Chunfu, Li Hui <i>et al</i> (904)

Materials Technology

Microstructures and Wear Behavior of Ni-based Spray-welding Coating on Pure Titanium TA1 Substrate	
.....	Wang Yan, He Qin, Xu Qiang <i>et al</i> (910)
Formation Mechanism of the Tubular TiB in Situ Formed in TiB/Ti-6Al-4V Composite Coatings by Laser Cladding	
.....	Li Xueqiao, Jin Tounan, Du Shejun <i>et al</i> (915)
Residual Stress at the Interface of Wire + Arc Additive Manufactured Titanium Alloy and Its Influence	
.....	Zhang Jikui, Chen Baihui, Zhang Xiang (920)

RARE METAL MATERIALS AND ENGINEERING

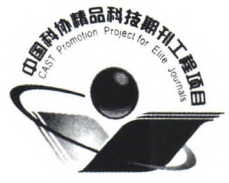
This publication is covered in SCI Expanded®, Research Alert®, and Materials Science Citation Index®
Monthly, International Scholarly Journal, ISSN 1002-185X Vol. 47 No. 3 Sum 380 March 2018

Interfacial Microstructure and Mechanical Properties of TZM Alloy Joints Brazed Using Ti-28Ni Filler Metal	
.....	Tian Xiao, Zhao Hongyun, Song Xiaoguo <i>et al</i> (927)
Effects of Trace Boron Addition on Microstructure and Properties of As-cast Ti6Al4V-xB Alloys	
.....	Zhang Feiqi, Chen Wenge, Yan Chaofeng (932)
Deformation Stored Energy and Dynamic Recrystallization Behavior of Pure Tungsten Processed by Multiple Directional Forging	
.....	Sun Dazhi, Li Ping, Lin Quan <i>et al</i> (937)
Electrical Contact Characteristics of Cu-Mo-WC Composites Prepared by Spark Plasma Sintering Process	
.....	Tian Baohong, Cheng Xinle, Zhang Yi <i>et al</i> (943)
Effect of Temperature on Friction and Wear Behavior of Multi-component CrTiAlN Coating	
.....	Lou Baiyang, Wang Xiaojing, Zhou Yan <i>et al</i> (949)
Influence of Sintering Duration and Particle Size on the Structure and Magnetocaloric Effect of Plate-shaped LaFe _{11.44} Si _{1.56} Hydrides	
.....	Tong Yongli, Guo Jie, Ren Zengxin <i>et al</i> (954)
Effects of Long-term Aging on Microstructure and Mechanical Properties of a Nickel-base Alloy	
.....	Wang Lu, Yang Gang, Liu Zhengdong <i>et al</i> (961)
Explosive Compact-coating Tungsten Copper Alloy to Copper Surface	
.....	Chen Xiang, Li Xiaojie, Yan Honghao <i>et al</i> (968)
Effect of Nitrogen-Oxygen Ratio on Structure and Optical Properties of AlO _x N _y Films	
.....	Meng Jianping, Du Miao, Liu Xiaopeng <i>et al</i> (972)
Effect of B Content on Environmental Embrittlement of Ordered (Fe,Co) ₃ V Alloys	
.....	Yang Biao, Chen Yexin, Li Shulong (976)
Effect of Fabrication Temperature on Microstructure and Mechanical Properties of C _f /Al Composites at Room and Elevated Temperature	
.....	Wang Zhenjun, Zhu Shixue, Yu Huan <i>et al</i> (982)
Effect of Minor Alloying on the Glass Forming Ability of U-Co Alloy	
.....	Huang Huogen, Ke Haibo, Liu Tianwei <i>et al</i> (990)
Effects of Thermal Diffusing DyZn Alloy Film on Magnetic Properties and Heat Resistance of Sintered NdFeB Magnets	
.....	Li Jiajie, Guo Chengjun, Zhou Toujun <i>et al</i> (995)
Effect of Hf Elements and CNTs Alloy Mixed Doping on Structure and Magnetic Properties of Nanocrystalline Sm ₅ Co ₁₉ Alloy	
.....	Wang Dongxin, Qiao Yinkai, Liu Dong <i>et al</i> (1001)
Selective Laser Melting of Tin Bronze Alloy and Its Properties	
.....	Bai Yuchao, Yang Yongqiang, Wang Di <i>et al</i> (1007)

Reviews

Research Progress of Transport Behavior Adjusted by Microstructure Design of Thermoelectric Materials	
.....	Liu Hongquan, Chu Zhiying, Cui Hongzhi <i>et al</i> (1013)
Research Progress of the Processing and Properties of MgB ₂ Wires and Tapes	
.....	Liu Haoran, Yang Fang, Wang Qingyang <i>et al</i> (1020)

XIYOU JINSHU CAILIAO YU GONGCHENG
稀有金属材料与工程



主管单位 中国科学技术协会
主办单位 西北有色金属研究院 中国有色金属学会 中国材料研究学会
出版单位 科学出版社
月刊 国内外公开发行 第 47 卷 第 3 期 总第 380 期 2018 年 3 月

- 美国 SCI Expanded[®], Research Alert[®], Materials Science Citation Index[®] 收录期刊
- 美国工程索引 (EI) 文献源期刊
- 国家重点学术期刊
- 国家精品科技期刊
- 两届中国百强报刊
- 两届国家期刊奖
- 期刊数字影响力百强
- 国家数字出版示范单位
- 中国优秀科技期刊一等奖
- 首届中国科协优秀国际科技期刊奖
- 中国有色金属工业优秀科技期刊一等奖
- 全国有色金属优秀科技期刊一等奖
- 中国期刊方阵双奖期刊
- 中国最具国际影响力的学术期刊
- 中国权威学术期刊
- 陕西省首届“大报名刊工程”期刊
- 陕西省优秀科技期刊特等奖
- 陕西省科协精品科技期刊
- 陕西省第 2 届精品科技期刊
- 陕西省新闻出版行业文明单位
- 中国科技论文统计源期刊
- 中国科学引文数据库文献源
- 中文核心期刊
- 中国材料科学核心期刊
- 同方数据独家授权期刊
- 美国化学文摘 (CA) 文献源期刊
- 英国科学文摘 (INSPEC) 文献源期刊
- 日本科学技术文献速报 (JICST) 用刊
- 俄罗斯文摘杂志 (AJ) 文献源期刊
- 剑桥科学文摘 (CSA) 文献源期刊
- 美、英金属文摘 (MA) 文献源期刊
- 美国国会图书馆收藏刊物

目 次

材料科学

Simulation of Electrodepositing Process Based on Supercritical Fluid and Test Research
.....Qian Haifeng, Lei Weining, Liu Weiqiao *et al* (717)

Corrosion Behavior of W-Mo Co-Penetrated Layer Produced by Glow Discharge Plasma Technique in Acid Solution
.....Chen Fei, Zhang Yulin, Liu Weiguang *et al* (723)

Influence of Mn Doping on the Electronic Structure and Absorption Spectrum of Ca₂SiO₄:Eu²⁺ Phosphor
.....Chen Haitao, Huang Xuefei, Huang Weigang (729)

Microstructure and Mechanical Properties of AZ31B Magnesium Alloy Prepared by Solid State Recycling
.....Wu Shuyan, Ji Zesheng, Hu Ming *et al* (736)

Effect of Sr Modification on Microstructures and Mechanical Properties of Al₃Ti/ADC₁₂ Composites
.....Wu Qingjie, Yan Hong, Liu Yuan *et al* (742)

A Simple and Effective Process to Join Coated Superconductors at a Low Resistance.....Zhang Han, Ma Guangtong, Li Xingtian *et al* (748)

Effect of Catalysts on Hydrolysis Hydrogen Release of Sodium Borohydride
.....Zheng Xueping, Guo Maowen, Liu Chunrong *et al* (754)

Surface Metallization of SiC Ceramic by Mo-Ni-Si Coatings for Improving Its Wettability by Molten Ag
.....Zhao Santuan, Zhang Xiangzhao, Liu Guiwu *et al* (759)

Effect of Processing Parameters on Gelcasting Process for Mo/Cu Powders.....Duan Bohua, Qi Chengkang, Wang Dezhi *et al* (766)

Influence of Hot Extrusion and Aging Treatment on the Properties of Biodegradable Mg-Zn-Y Alloy
.....Qiao Xueyan, Yu Kun, Chen Liangjian *et al* (773)

Structure and Mechanical Property of Friction-Stir Weld Joint of 2195-T8 Al-Li Alloy Plate.....Li Jinfeng, Chen Yonglai, Zhang Xuhu *et al* (780)

XIYOU JINSHU CAILIAO YU GONGCHENG
稀有金属材料与工程

主管单位 中国科学技术协会
主办单位 西北有色金属研究院 中国有色金属学会 中国材料研究学会
出版单位 科学出版社
月刊 国内外公开发行人 第 47 卷 第 3 期 总第 380 期 2018 年 3 月



Effects of Ti Sheet Insert on Microstructure and Properties of Graded
Composites of TiB₂-based Ceramic and Ti-6Al-4V Alloy
.....Chen Shuo, Zhao Zhongmin, Zhang Long *et al* (788)

Correlation Between Microstructure and Corrosion Behavior
of Zr-0.8Sn-1Nb-0.3Fe Alloy
.....Yang Zhongbo, Cheng Zhuqing, Qiu Jun *et al* (794)

Strength Stability of Aging Hardened Mg-10Y-1.5Sm Alloy
.....Zhang Qing, Chen Jun, Li Quanan (799)

Ti 对高硼钢显微组织和高温力学性能的影响
.....陈 祥, 李言祥, 王志胜等 (803)

新型超高强韧钛合金热变形行为研究
.....王 哲, 王新南, 商国强等 (810)

新 β 型 Ta-TiAl 合金的高温开裂行为
.....罗媛媛, 毛小南, 吴金平等 (816)

不同晶体取向 Mo-Nb 单晶的纳米压痕尺寸效应
.....张 文, 张平祥, 高选乔等 (822)

动高压加载条件下 Ti-6Al-4V 和 Ti-47Nb 合金层裂微结构特征与
断裂机理.....刘 慧, 于晓东, 谭成文等 (829)

TiAl 基合金动态再结晶临界模型建立
.....万志鹏, 孙 宇, 胡连喜等 (835)

Al₂O₃ 型壳与 DD6 单晶合金的界面反应
.....姚建省, 李 鑫, 王丽丽等 (840)

第一性原理研究压力对 Ni-Mo 二元化合物力学性能和电子结构的影响
.....王 娟, 侯 华, 赵宇宏等 (846)

纳米单晶 γ -TiAl 合金应变速率效应分子动力学模拟
.....罗德春, 张 玲, 付 蓉等 (853)

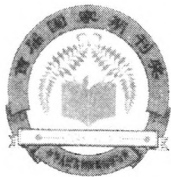
Al、Ti 含量对锻态 Incoloy825 合金组织和耐腐蚀性能的影响
.....孙 楠, 温 宸, 刘子利等 (860)

高热负荷作用下钨的热疲劳损伤研究
.....马 栋, 王 波, 王 亮等 (867)

Mn 在 2297 铝锂合金中的微合金化作用
.....桑冯建, 郑子樵, 王海金 (871)

出 版 科学出版社
(北京市东黄城根北街 16 号, 100717)
编 辑 《稀有金属材料与工程》编辑部
主 编 张平祥
副主编 石应江
编辑部主任 李 哲
责任编辑 蒲正利 刘延昌 谢 曼
梁 燕 苑 硕
英文编辑 齐国翠
编 务 刘亚利
排 版 王 嵘 杜亚凤
本期责任编辑 谢 曼 蒲正利
印 刷 西安创维印务有限责任公司
国内发行 中国邮政集团公司
陕西省报刊发行局
国内发行代号 52-172
国外发行 中国国际图书贸易有限公司
(北京市 399 信箱, 100048)
国外发行代号 M4873
编辑部地址 西安市 51 号信箱 710016
电 话 029-86231117
传 真 029-86231103
<http://www.rmme.ac.cn>
E-mail: rmme@c-nin.com
国内统一连续出版物号 CN 61-1154/TG
国际标准连续出版物号 ISSN 1002-185X
广告经营许可证号 6100004000085
国内外公开发行人
定 价 100 元

XIYOU JINSHU CAILIAO YU GONGCHENG
稀有金属材料与工程



主管单位 中国科学技术协会
主办单位 西北有色金属研究院 中国有色金属学会 中国材料研究学会
出版单位 科学出版社
月刊 国内外公开发行人 第 47 卷 第 3 期 总第 380 期 2018 年 3 月

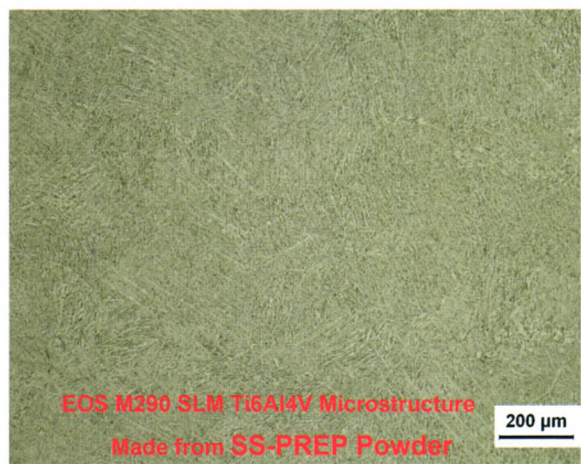
喷射成形 GH738 合金热变形特性及微观组织演变	王 悦, 许文勇, 刘 娜等 (878)
基于元胞自动机 AZ31 镁合金微观组织模型	楚志兵, 张 铎, 江连运等 (884)
高 Mo 超级奥氏体不锈钢和 Ni-Cr-Mo 镍基合金析出相研究及对比	宋志刚, 徐长征, 浦恩祥等 (895)
2205 双相不锈钢在酸性 H ₂ S 环境下的应力腐蚀行为及开裂机理	杨世洲, 李春福, 李 辉等 (904)

材料工艺

TA1 纯钛表面镍基喷焊层的组织和磨损性能	王 艳, 何 芹, 徐 强等 (910)
激光原位制备 TiB/Ti-6Al-4V 复合涂层中 TiB 管状结构的形成机制	李雪娇, 金头男, 杜社军等 (915)
电弧增材制造钛合金界面处残余应力及其影响	张纪奎, 陈百汇, 张 向 (920)
Ti-28Ni 钎料真空钎焊 TZM 合金接头界面组织与力学性能	田 骁, 赵洪运, 宋晓国等 (927)
微量硼元素添加对 Ti6Al4V-xB 组织及性能的影响	张飞奇, 陈文革, 闫超峰 (932)
多向锻造纯钨形变储能及动态再结晶行为分析	孙大智, 李 萍, 林 泉等 (937)
放电等离子烧结 Cu-Mo-WC 复合材料电接触特性	田保红, 程新乐, 张 毅等 (943)
温度对复合 CrTiAlN 涂层摩擦磨损性能的影响	楼白杨, 王肖璟, 周 艳等 (949)
高压烧结时间及颗粒尺寸对片状 LaFe _{11.44} Si _{1.56} 氢化物块体结构及磁热效应的影响	佟永丽, 郭 杰, 任增鑫等 (954)
长期时效对一种镍基合金的组织与性能影响	王 鲁, 杨 钢, 刘正东等 (961)
爆炸压涂钨铜覆层到铜表面的研究	陈 翔, 李晓杰, 闫鸿浩等 (968)
氮氧比对 AlO _x N _y 薄膜结构和光学性能的影响	孟建平, 杜 淼, 刘晓鹏等 (972)
硼含量对有序态(Fe,Co) ₃ V 合金环境氢脆的影响	杨 彪, 陈业新, 李树龙 (976)
预热温度对 C _f /Al 复合材料微观组织及室温与高温力学性能的影响	王振军, 朱世学, 余 欢龙等 (982)
微合金化对 U-Co 金属玻璃形成能力的影响	黄火根, 柯海波, 刘天伟等 (990)
热扩渗 DyZn 合金膜层对烧结钕铁硼磁性能与耐热性能的影响	李家节, 郭诚君, 周头军等 (995)
Hf、CNTs 混合掺杂对纳米晶 Sm ₅ Co ₁₉ 合金结构和磁性能的影响	王东鑫, 乔印凯, 刘 东等 (1001)
锡青铜激光选区熔化工艺及其性能	白玉超, 杨永强, 王 迪等 (1007)

综合评述

热电材料微结构调控热电输运行为的研究进展	刘洪权, 楚志颖, 崔洪芝等 (1013)
MgB ₂ 线带材工艺及性能研究进展	刘浩然, 杨 芳, 王庆阳等 (1020)



西安欧中材料科技有限公司

Sino-Euro Materials Technologies of Xi'an Co., Ltd.

西安欧中材料科技有限公司隶属于西北有色金属研究院(集团), 专业从事金属球形粉末生产的高新技术企业, 注册资本6000万元。公司引进国外成套等离子旋转电极制粉生产线, 获授权国家专利10余项, 主要致力于钛合金、高温合金、钴铬合金、特种不锈钢及难熔金属球形粉末的研发、生产和销售, 产品主要应用于航空航天、金属增材制造、生物医疗等领域。

西安欧中材料科技有限公司已被西安市认定为高新技术企业, 通过ISO9001质量体系认证、AS9100航空航天质量管理体系认证、ISO13485医疗器械体系认证。

SMT PREP Powder

Standard Spherical Powder Products

CP Titanium
Ti-6Al-4V Grade 5 & 23
Ti-6Al-4V 800ppm
BT20(TA15), Ti-6Al-7Nb
Maraging steel, Stainless steel
In625, In718, Hastelloy X
EP741NP
Co-Cr-W, Co-Cr-Mo

Customized Spherical Powder Products

Tantalum
Vanadium
TiAl, Ti₂AlNb
Specialty steel(AF1410, AeroMet 100)

地址: 陕西省西安市凤城二路45号

电话: 029-86261802

传真: 029-86261802

邮箱: market@c-semt.com

网址: www.c-semt.com



ISSN 1002-185X

CN 61-1154/TG



03>