

目次 CONTENTS

专题——热喷涂技术及工程应用

Special Topic—Thermal Spraying Technology and Engineering Application

1 等离子喷涂生物涂层对病理性骨缺损愈合的应用研究

Application Research of Plasma Sprayed Bioactive Coatings for Bone Regeneration under Pathological Conditions

刘诗伟, 李恺, 郑学斌

LIU Shi-wei, LI Kai, ZHENG Xue-bin

10 热喷涂制备固体氧化物燃料电池电解质层的研究进展

Research Progress on Preparation of Solid Oxide Fuel Cells Electrolyte Layer by Thermal Spraying

冯潇, 赵雪雪, 邢亚哲

FENG Xiao, ZHAO Xue-xue, XING Ya-zhe

18 悬浮液等离子喷涂热障涂层研究进展

Development of Suspension Plasma Spray Thermal Barrier Coatings

袁涛, 王世兴, 何箐, 梁立康

YUAN Tao, WANG Shi-xing, HE Qing, LIANG Li-kang

28 Influence of Microstructures on Thermal Shock and Sintering Behavior of YSZ-based Thermal Barrier Coatings

Kirsten Bobzin, Lidong Zhao, Mehmet Öte, Tim Königstein

34 原位微锻造冷喷涂制备高致密铝基涂层及耐腐蚀性能

Fully Dense Al Coatings Sprayed by In-situ Micro-forging Assisted Cold Spray and Corrosion Protection

雒晓涛, 魏瑛康, 张越, 李长久

LUO Xiao-tao, WEI Ying-kang, ZHANG Yue, LI Chang-jiu

40 SiC-Al₂O₃-SiO₂ 复合陶瓷涂层组织结构及抗烧蚀性能研究

Microstructures and Anti-ablation Properties of SiC-Al₂O₃-SiO₂ Composite Ceramic Coatings

孙世杰, 马壮, 柳彦博, 刘玲, 高丽红, 朱时珍

SUN Shi-jie, MA Zhuang, LIU Yan-bo, LIU Ling, GAO Li-hong, ZHU Shi-zhen

48 超音速火焰喷涂制备的 WC-WCoB 涂层在熔锌中的腐蚀行为及其耐蚀机理

Corrosion Behavior and Corrosion Resistance Mechanism of HVOF Sprayed WC-WCoB Coating in Molten Zinc

严细锋, 王海滨, 仇庆凡, 宋晓艳

YAN Xi-feng, WANG Hai-bin, QIU Qing-fan, SONG Xiao-yan

55 前驱体溶液等离子喷涂参数对涂层形貌的影响及沉积行为机理研究

Influence of Solution Precursor Plasma Spraying Parameters on Coating Morphology and Mechanism of Coating Deposition Behavior

王瑞, 叶福兴, 段佳昊

WANG Rui, YE Fu-xing, DUAN Jia-hao

61 NiAl/NiCoCrAlY/8YSZ 复合喷涂层的微观结构与性能研究

Microstructure and Properties of NiAl/NiCoCrAlY/8YSZ Composite Coatings

付伟, 黄国胜, 程旭东, 邵刚勤

FU Wei, HUANG Guo-sheng, CHENG Xu-dong, SHAO Gang-qin

68 激光重熔对电弧喷涂含非晶相铁基涂层性能的影响

Effect of Laser Remelting on Slurry Erosion and Corrosion Properties of Arc-sprayed Fe-based Amorphous-containing Coatings

纪秀林, 顾鹏, 王振松, 唐秋逸, 李泽

Ji Xiu-lin, GU Peng, WANG Zhen-song, TANG Qiu-yi, LI Ze

75 不同环境下 AlSiFeMm 非晶纳米晶涂层摩擦磨损行为研究

Wear Behaviors of As-sprayed AlSiFeMm Amorphous/Nanocrystalline Coating in Different Environments

刘奇, 程江波, 冯源, 梁秀兵, 陈永雄, 胡振峰

LIU Qi, CHENG Jiang-bo, FENG Yuan, LIANG Xiu-bing, CHEN Yong-xiong, HU Zhen-feng

84 液相等离子喷涂制备 Au-WO₃ 复合涂层及其气敏机理

Au-WO₃ Coating Prepared by Liquid-phase Plasma Spraying and Sensing Mechanism

陈晓晓, 姚阳光, 谭礼明, 顾青山, 袁建辉, 赵文杰

CHEN Xiao-xiao, YAO Yang-guang, TAN Li-ming, GU Qing-shan, YUAN Jian-hui, ZHAO Wen-jie

91 HA 粉末粒径对微束等离子喷涂扁平粒子形貌及涂层微结构的影响

Effects of Hydroxyapatite Particle Size on Splat Morphology and Coating Microstructure during Micro-plasma Spraying

王国红, 刘晓梅, 贺定勇, 周正, 王曾洁, 吴旭

WANG Guo-hong, LIU Xiao-mei, HE Ding-yong, ZHOU Zheng, WANG Zeng-jie, WU Xu

97 C₆/SiC 表面等离子喷涂金属过渡层及其界面结合特征

Plasma-sprayed Metallic Transition Coating on C₆/SiC Surface and Interface Bonding Characteristics

李玉涛, 李辉

LI Yu-tao, LI Hui

104 自蔓延法制备球形 ZrB₂-SiC 复合等离子喷涂粉末

Spherical ZrB₂-SiC Composite Plasma Spraying Powder by Self-propagating High-temperature Synthesis

张博康, 张晓梅, 李江涛, 杨增朝, 宁先进, 王全胜

ZHANG Bo-kang, ZHANG Xiao-mei, LI Jiang-tao,

YANG Zeng-chao, NING Xian-jin, WANG Quan-sheng

110 激光等离子复合热源喷涂工艺沉积机理研究

Deposition Mechanism of Laser Hybrid Plasma Spraying Technology

李淑青, 李其连, 贺金生

LI Shu-qing, LI Qi-lian, HE Jin-sheng

116 电接触烧结增强 NiCr-Cr₃C₂ 涂层的显微组织和摩擦磨损行为研究

Microstructure and Tribological Properties of NiCr-Cr₃C₂ Coating Deposited by Electro-contact Sintering

赵磊, 侯金保, 孟军虎, 韩杰胜

ZHAO Lei, HOU Jin-bao, MENG Jun-hu, HAN Jie-sheng

专题——刀具表面硬质涂层技术

Special Topic—Hard Coating Technology on Tool Surface

122 硬质合金气态渗硼预处理及其对金刚石薄膜附着性能的影响

Gaseous Boronizing Pretreatment of Cemented Carbide and Effects on the Adhesion Performance of Diamond Films

易铭昆, 肖和, 魏秋平, 邓彪, 罗一杰, 李亮, 马莉, 周科朝, 张雷

YI Ming-kun, XIAO He, WEI Qiu-ping, DENG Biao,

LUO Yi-jie, LI Liang, MA Li, ZHOU Ke-chao, ZHANG Lei

130 AlCrN/VN 多层涂层力学性能及其热稳定性

Mechanical Properties and Thermal Stability of AlCrN/VN Multilayer Coatings

万强, 罗畅, 魏民, 李晓峰, 肖洋轶, 王鹏, 张俊, 杨兵

WAN Qiang, LUO Chang, WEI Min, LI Xiao-feng,

XIAO Yang-yi, WANG Peng, ZHANG Jun, YANG Bing

137 高功率脉冲和脉冲直流磁控共溅射 CrAlN 薄膜的研究

CrAlN Coatings Prepared by HiPIMS/Pulsed-DC Co-sputtering

郭玉垚, 王铁钢, 李柏松, 刘艳梅, 蒙德强, 许人仁

GUO Yu-yao, WANG Tie-gang, LI Bai-song, LIU Yan-mei, MENG De-qiang, XU Ren-ren

145 高能离子刻蚀前处理对 AlTiSiN 涂层切削性能的影响

Effects of High Energy Ion Cleaning Pre-treatment on Cutting Performance of AlTiSiN Coatings

梁加刚, 许昌庆, 王标, 高营, 蔡飞, 张世宏

LIANG Jia-gang, XU Chang-qing, WANG Biao, GAO Ying, CAI Fei, ZHANG Shi-hong

152 VN 基硬质耐磨涂层的制备及其性能

Preparation and Properties of VN Based Antiwear Hard Coatings

田灿鑫, 何诗敏, 何世斌, 王泽松, 邹长伟, 唐晓山, 李助军, 刘怡飞
TIAN Can-xin, HE Shi-min, HE Shi-bin, WANG Ze-song,
ZOU Chang-wei, TANG Xiao-shan, LI Zhu-jun, LIU Yi-fei

160 低转速下多弧离子镀制备的 Mo-Ti-Al-N 超晶格硬质涂层的微结构及背散射谱分析

Analysis on Microstructure and Backscattering Spectroscopy of Superlattice Mo-Ti-Al-N Hard Coatings Prepared by Multi-arc Ion Plating at Low Rotation Speed

王泽松, 梁枫, 项燕雄, 李松权, 田灿鑫, 邹长伟
WANG Ze-song, LIANG Feng, XIANG Yan-xiong, LI Song-quan, TIAN Can-xin, ZOU Chang-wei
168 CrC 中间层碳含量对 CrC/a-C : H 涂层附着力的影响

Effect of Carbon Content of CrC Interlayer on the Adhesion of CrC/a-C : H Coatings

黄志宏, 杨豆, 付德君, 杨兵
HUANG Zhi-hong, YANG Dou, FU De-jun, YANG Bing

175 Al 含量对 $Ti_{1-x}Al_xN$ 涂层组织结构、力学性能和铣削性能的影响

Effect of Aluminum Content on Microstructure, Mechanical Properties and Milling Performance of $Ti_{1-x}Al_xN$ Coatings

林亮亮
LIN Liang-liang

表面强化及功能化 Surface Strengthening and Functionalization

182 模芯钴含量对仿荷叶 PDMS 制件表面疏水性的影响

Effects of Mass Fraction of Cobalt in Mold Inserts on the Hydrophobicity of Mimic Lotus Leaf PDMS Parts

董彦灼, 蒋炳炎, 强军
DONG Yan-zhuo, JIANG Bing-yan, QIANG Jun

189 超声冲击强化铝合金小孔构件的试验研究

Experimental Study of Aluminium Alloy Hole Test Specimen Reinforced by Ultrasonic Impact

耿其东, 汪炜
GENG Qi-dong, WANG Wei

196 304 不锈钢表面聚吡咯纳米结构的构建及其抗细菌粘附性能

Construction and Anti-bacteria Adhesion Properties of Polypyrrole Nanostructures on 304 Stainless Steel Surface

聂铭, 黄丰, 王珍高, 宁成云
NIE Ming, HUANG Feng, WANG Zhen-gao, NING Cheng-yun

203 静电喷涂高附着力疏水涂层及其性能

High Adhesion Hydrophobic Coating by Electrostatic Spraying and Properties

曾盛渠, 董雪芳, 叶真午, 张绮韵, 曾荃
ZENG Sheng-qu, DONG Xue-fang, YE Zhen-wu, ZHANG Qi-yun, ZENG Quan

209 水滴模板法制备聚乳酸微纳米纤维薄膜

Preparation of Poly (Lactic Acid) Nanofiber Film by Breath Figures Method

段宪法, 李玲, 于永建
DUAN Xian-fa, LI Ling, YU Yong-jian

215 超憎水 $SiO_2/FEVE$ 复合涂层的制备

Preparation of Superhydrophobic $SiO_2/FEVE$ Composite Coating

宗立君, 李辛庚, 吴亚平, 米春旭, 姜波
ZONG Li-jun, LI Xin-geng, WU Ya-ping, MI Chun-xu, JIANG Bo

表面摩擦磨损与润滑 Surface Friction Wear and Lubrication

223 Ni-金刚石复合涂层的厚膜化及其耐磨性研究

Thickening Deposition and Wear Resistance of Ni-Diamond Composite Coating

徐雨生, 丁慧, 向莉, 沈倩倩, 金秋, 张瑜, 聂朝胤
XU Yu-sheng, DING Hui, XIANG Li, SHEN Qian-qian, JIN Qiu, ZHANG Yu, NIE Chao-yin

230 表面织构参数对液压马达滑靴副的摩擦学性能影响研究

Effect of Texture Parameters on Tribological Performance of Slipper Surface in Hydraulic Motor

张东亚, 孙喜洲, 高峰, 钟善军, 段继豪

ZHANG Dong-ya, SUN Xi-zhou, GAO Feng, ZHONG Shan-jun, DUAN Ji-hao

237 水平弯管含砂分散泡状流冲蚀机理分析

Analysis of Sand Erosion Mechanism of Horizontal Pipe Bend under Dispersed Bubble Flow

彭文山, 邢少华, 曹学文, 侯健, 胥锟, 韩明一

PENG Wen-shan, XING Shao-hua, CAO Xue-wen, HOU Jian, XU Kun, HAN Ming-yi

表面失效及防护 Surface Failure and Protection

245 声发射在线监测酸性环境下油气管材腐蚀研究综述

Review of On-line Monitoring of Oil and Gas Pipelines Corrosion in Acidic Environment by Acoustic Emission Technology

范舟, 胡敏, 张坤, 黄泰愚, 王子瑜

FAN Zhou, HU Min, ZHANG Kun, HUANG Tai-yu, WANG Zi-yu

253 厚类金刚石碳基薄膜的制备及摩擦与腐蚀性能的表征

Preparation of Thick Diamond-like Carbon Based Films and Characterization of Friction and Corrosion Properties

李安, 李霞, 王云锋, 张广安, 万善宏

LI An, LI Xia, WANG Yun-feng, ZHANG Guang-an, WAN Shan-hong

262 多壁异氰酸酯微胶囊的制备及其在自修复防腐涂层中的应用

Preparation of Isocyanate-loaded Multi-wall Microcapsules and Application in Self-healing and Anticorrosive Coatings

郑楠, 刘杰, 李文戈, 肖雯, 李宗林

ZHENG Nan, LIU Jie, LI Wen-ge, XIAO Wen, LI Zong-lin

270 应力应变下 TC2 钛合金在模拟海水环境中的腐蚀行为

Corrosion Behavior of TC2 Titanium Alloy under Strain-stress in Simulated Seawater

边美华, 彭家宁, 尹立群, 梁庆国, 张兴森

BIAN Mei-hua, PENG Jia-ning, YIN Li-qun, LIANG Qing-guo, ZHANG Xing-sen

膜层材料与技术 Coating Material and Technology

279 CeO₂ 对 ZrH_{1.8} 表面微弧氧化复合陶瓷层结构的影响

Effect of Cerium Oxide on ZrH_{1.8} Surface Micro-arc Oxidation Composite Ceramic Layer

李世江, 闫淑芳, 钟学奎, 陈伟东, 杜培, 杨少辉, 马文

LI Shi-jiang, YAN Shu-fang, ZHONG Xue-kui,

CHEN Wei-dong, DU Pei, YANG Shao-hui, MA Wen

285 三光束光内同轴送丝激光熔覆成形新方法研究

New Forming Method of Coaxial Wire Feeding inside Three Beams Laser Cladding

吉绍山, 刘凡, 傅戈雁, 石世宏

JI Shao-shan, LIU Fan, FU Ge-yan, SHI Shi-hong

294 不锈钢根管锉镀覆 TiN、ZrN 膜的沉积工艺与性能研究

Deposition Process and Properties of TiN and ZrN Films Coated on Stainless Steel Root Canal Files

阎鑫, 张钧, 于亚男

YAN Xin, ZHANG Jun, YU Ya-nan

表面质量控制及检测 Surface Quality Control and Detection

302 磁粒研磨去除 Al 7075 交叉孔棱边毛刺的试验研究

Experimental Study of Deburring in Al 7075 Cross Hole Edge Based on Magnetic Particles Grinding

焦安源, 张龙龙, 刘新龙, 陈燕

JIAO An-yuan, ZHANG Long-long, LIU Xin-long, CHEN Yan