

现代制造 技术与装备

2018 6

MODERN MANUFACTURING TECHNOLOGY AND EQUIPMENT

《中国期刊全文数据库 (CJFD)》全文收录期刊
《中国学术期刊 (光盘版)》全文收录期刊
《中国学术期刊综合评价数据库 (CAJCED)》统计源期刊
《万方数据——数字化期刊群》全文收录期刊
《中文科技期刊数据库 (全文版)》收录

第十六届中国国际铸造博览会

The 16th China International Foundry Expo

2018年5月16日-19日

May 16-19, 2018

中国国际展览中心 (新馆)

China International Exhibition Center (New Venue)

开幕典礼
Opening Ceremony

第十八届中国国际冶金工业展览会

The 18th China International Metallurgical Industry Expo

第十六届中国国际工业炉展览会

The 16th China International Industrial Furnace Exhibition

第十四届中国国际耐火材料及工业陶瓷展览会

The 14th China International Refractories and Industrial Ceramics Exhibition



山东省铸造协会组织企业

赴京参加中国国际铸造博览会

山东机械工程学会会刊

万方数据

ISSN 1673-5587



主管 山东省机械工业协会
主办 山东省机械设计研究院

理事会

理事长: 刘卫东
副理事长: 林江海
理事:

陈声环 曾庆良 邓德乐 齐晓光 李保民
李胜军 李政军 毛志猛 孟庆堂 尚书旗
孙龙平 孙清洲 孙少军 宋家禄 汤世贤
王新建 魏修亭 徐龙泉 薛兴振 许宪志
许允和 于元波 张万谋 张承瑞 张跃成
张志刚 张世君 昞向博 姜小兴 薛峰
孙振华 郭信学 沙克清 马昭喜 马祖文

杂志社

社长: 林江海
副社长: 唐炳武 周靖 夏玉海 姚立新
主编: 吴小临
副主编: 徐民兴
编辑: 刘凌 张秀明 许彦红 郭鹏
英译: 李莹 王建文
编委: 边秀房 丁明 樊炳辉 黄传真
李木森 李军 李玉奎 刘川
刘永飞 石长河 孙宏飞 孙宁
王善坡 徐刚 周以齐 赵玉刚
曹明通

出版: 《现代制造技术与装备》杂志社
编辑: 《现代制造技术与装备》编辑部
发行: 《现代制造技术与装备》广告发行部
刊号: ISSN1673-5587
CN37-1442/TH
广告代理权: 山东机械传播中心
广告经营许可证: 鲁工商广字 01172
印刷: 济南景升印业有限公司
定价: 15.00 元

《现代制造技术与装备》杂志社

地址: 济南市济洛路 129 号
编辑: 250031
电话: 0531-85955168 0531-86071981
Http://www.sdji.cbpt.cnki.net
E-mail:sdjx168@163.com mmte@163.com
zzjsyzb@163.com zzjsyzb@126.com
万方数据

·设计与研究·

- 基于 UG 平台的铣床夹具设计研究……………李艳霞 郭新兰 (1)
基于 PLC 通信的高压配电在线监测系统设计……………马文超 (3)
基于 TRIZ 理论的 CO₂ 热泵机组产品创新设计
……………石征锦 富斯盟 苏新宇 皇甫尚伟 张孝顺 (5)
夹片机床自动上下料机的设计与应用……………范嘉 管菁 (7)
步态康复训练装置的减重技术研究现状……………陶娟 (9)
风送施药机研究现状及趋势……………翟兆焯 郭培全 乔阳 (12)
校园快递智能收发机设计研究……………张建华 张清萍 何银川 (15)
基于计算机运动仿真模型构建的护理床设计分析……………王学龙 (18)
印刷机蘸油机构系统设计与分析……………郑红 (19)
聚光式太阳能热发电关键技术研究……………胡金亮 靳宣强 张纪同 王永 (22)
连接件栓焊结合面动态特性因素仿真分析……………王媛 易鑫 姜稀 (23)
电动汽车驱动用永磁同步电动机系统效率优化控制研究
……………苏锦智 张继鹏 付荣华 (25)
基于 Codesys 的筑路机械的测控系统设计……………侯念荣 (26)
基于嵌入式图像识别的煤粉锅炉火焰检测系统设计……………刘刚 (28)
铁路车辆侧墙张拉蒙皮失稳变形控制工艺研究
……………王宇 杨驰 张雷 张彤阳 麻彬彬 (30)
数控加工质量控制的关键环节研究……………周栋华 (32)
某无人机用小型涡喷发动机寿命试车研究……………顾志岗 钱松林 彭云晖 吴进军 (33)
BAJA 车架有限元静力学分析……………包斯宇 张兴 郑艳丽 汤岩 (35)
轻型国五柴油车排放油耗数据研究分析……………关娇 (37)
教学型龙门刨床的研制……………梁自成 (41)
下肢外骨骼运动学与 ADAMS 仿真分析……………曹宇飞 樊军 (43)
城市公交客车扶手设计研究……………陈朝泽 (45)
基于单片机的精准空投控制系统研究……………黄敏 张海涛 张新伟 (47)
浅谈能量守恒定律在机电工程中的应用……………贺江鸥 (51)
基于相关系数原理 EMD 的转子故障特征提取方法研究……………吕世鹏 (54)
基于有限元分析法的液压制动钳耐压性能仿真
……………余祥 范伟军 张章 於康杰 傅乐 (56)
车床刀套设计制造和结构有限元分析……………王坤峰 王龙飞 (59)
深沟球轴承装配机的工作方式研究……………赵春辉 (61)
铁路机车直驱牵引高效永磁电机关键技术研究……………刘立东 (63)
残疾人用电子脚蹼的设计
……………华俊阳 何恩光 张乐天 唐骏 陈雅洁 张雅晶 (64)
先进的蓄热式燃烧系统的控制原理分析及应用研究……………王文兵 (66)
基于 AT89S52 单片机的双精度电子称设计……………靳 姗 (67)
基于工程机械一体化的检测与故障诊断分析研究……………蔡传兵 张传琦 (69)
基于气动反馈式电信号控制装置的设计……………梁秦 卢猛 周明阳 (70)
FANUC Oi-MD 数控系统电池维护与改造的策略研究
……………李海斌 戴雪华 余威 (72)
多功能后勤保障车设计方案……………李煜焯 吴幸铃 林卡 (73)
基于数控设备系统的设计研究……………张传琦 蔡传兵 (75)
动车组齿轮箱润滑油黏度计算方法研究……………李枫 刘志远 金思勤 吴成攀 (77)
浅谈液压系统的绿色设计与制造……………余楠 徐艳军 (79)
基于 3D 打印技术下机械零件创新自由设计的思考……………张德龙 (80)
基于 SolidworksPDM 的非标自动化设备设计重用解决方案……………潘新宇 (83)
·工艺与装备·
工业燃气热处理炉的可变容控制及供电模式探讨……………陈瑜 (86)
优化焊接工艺 防止焊件低温脆性破坏……………达运社 达卿文 (87)
超低温摆锤冲击试样低温仪的研发与应用……………刘琳 赵猛 刘建宇 谢世军 (90)
2124 铝合金时效成形保温工艺优化方法……………吕源 (91)
数控刀具系统在型钢轧辊加工中的研究与应用……………田长君 (93)
汽车发动机端盖加工工艺改进……………张开学 徐宝军 张勃 (95)
110kV 变电站内电气设备安装过程中存在的问题及解决方法……………刘敬祥 (97)

电动塞拉门控制系统故障分析与诊断方法初探	郭显鹏 (99)
金属材料热处理变形控制措施探析	张磊 (100)
测井车滚子链失效形式分析及应用	董义 (102)
浅谈斗轮式堆取料机的构造及功能	张建伟 (104)
单小车垂直主梁倾翻铸造起重机	赵民 田晓莹 (106)
单脉冲二次雷达的常见伪目标干扰及其抑制方法	张涛 向兵 (107)
空心轴热处理裂纹原因分析	吴玉兰 (109)
煤矿机电运输中的隐患及预防措施	吕跃华 边德政 (111)
浅谈直联式通风机的振动控制方法	毛海福 (112)
对基于 Teamcenter 的数控加工工艺设计分析	郑旭 秦玉京 (114)
直齿渐开线锥齿轮加工工艺研究	李宝强 (116)
基于 Vold-Kalman 阶比跟踪和能量分析的旋转机械故障特征识别	王东晓 (117)
风力发电机电动叶轮锁	王浩羽 乔金梦 孙仲秋 许文豪 王树强 (120)
焊接技术在热力管道安装中的应用分析	吕旗 (121)
液压传动教学实验台的改进	周志平 熊轶娜 (123)
液阀阀冲蚀磨损特性分析与结构探讨	魏世鹏 (125)
一种车载太阳能通风散热系统控制方案的探讨	李广华 陈永敏 陈孝鹏 (127)
某 3100t 级 LNG 动力散货船机舱安全评估分析	汪行 刘锋 (129)
温度变化对压缩机精加工零件的加工、测量影响	王云龙 (131)
起爆药生产线产能提升与优化	张伟 黄群英 邹春根 (133)
高铁枢纽车站中央空调系统维护保养的探讨与实践	冯伟林 (135)
船舶轮机检验常见缺陷与排除措施研究	刘卓桓 (138)
核电站气动截止阀常见故障及维修	彭俊杰 (140)
非制冷红外热像仪的测温算法	刘佳钰 (141)
高速切削加工技术	徐磊 李强 王冲 (143)
化工仪器仪表的维修技巧探讨	赵魁 (144)
汽车发动机典型故障分析与维修对策	卢意 刘永强 陈静 (146)
浅谈高速动车组车内噪音的控制技术	邹佳翔 郝婷婷 (148)
多轴数控加工技术应用现状及发展趋势	高乐 (151)
某换流站噪声扰民原因及对策	傅高健 李国奇 陈建明 黄治军 黄翔 (153)
浅谈车削螺纹时常见产生废品的原因及预防措施	高志全 赵玉岐 (154)
桥式起重机的电气控制分析与故障处理探讨	唐启儒 (156)
试论压力容器的焊接技术与对策	杨鸣宇 (158)
数控车方机床的加工和发展趋势研究	王义朋 (159)
浅谈煤矿井下运输设备再制造技术的应用与实施	王志国 (161)
浅析嵌入式系统在医疗设备中的应用	郝文廷 (162)
空压机余热回收节能改造	邵慧 查明彦 吴振 (164)
分析压力容器制造过程中变形问题的控制对策	黄星泉 (165)
某型压力开关开启压力降低问题研究	李旭东 潘智勇 卢猛 周明阳 苏开明 (167)
· 自动化与控制 ·	
空压机远程控制智能化改造	查明彦 邵慧 吴振 (168)
管接件上下料工业机器人技术	戚顺平 梁松千 唐玉芝 (170)
电气自动化在立体车库装置中的应用	李伟 (172)
· 行业交流 ·	
共享单车在城市发展中影响分析	
——以合肥市为例	郭沐轩 邓灵颖 王秀桂 (174)
基于产教结合的地铁给排水施工相关岗位实践能力培养研究与探索	郑枫 王亚飞 张凤琴 (177)
校企合作高职院校数控人才培养实践教学体系建设研究	刘伟 (178)
航天产品零件热处理全周期质量控制	王义嘉 (180)
基于 inventor 软件的仿真实训模式分析	杨义慧 (181)
研究和探索以产品为载体的金工教学模式改革	高飞 陈青 夏文胜 焦丽丽 成岗 (183)
易扩展式立体停车库	刘蒙霖 石力王 廖光涛 何陈 彭丹 (185)
基于行动导向教学模式下《数控车削编程与加工》课程教学资源建设研究	邹二勇 刘济慧 朱海江 裘海炳 (187)
空气源热泵热水器运行特性与应用研究	莫顺权 (189)
“甩手掌柜”共享储物柜可行性研究	刘洋 杨婷 王晨 (191)

Modern Manufacturing Technology And Equipment

Contents

• Design and research •

Research on the Design of Milling Machine Fixture Based on UG Platform	(1)
Design of High Voltage Distribution Online Monitoring System Based on PLC	(3)
Product Innovation Design of CO ₂ Heat Pump Unit Based on TRIZ Theory.....	(5)
Design and Application of Automatic Loading and Unloading Machine for Splint Machine Tool.....	(7)
Research on Weight Reduction Technique of Gait Rehabilitation Training Device	(9)
Current Situation and Trend of Research on Airsupply Sprayer	(12)
Research on Campus Express Intelligent Transceiver Design	(15)
Designanalysis on Nursing Bed Based on Computer Motion Simulation Model Constructing	(18)
System Design and Analysis of the Printing Machine Dipping Oil Mechanism.....	(19)
Research on Key Technology of Solar Energy Thermal Power Generation	(22)
Simulation Analysis of Dynamic Characteristics of Joint Bolt-welded Joints	(23)
Research on Efficiency Optimization Control of Permanent Magnet Synchronous Motor System for Electric Vehicle Driving	(25)
Design and Control System of Road Building Machinery Based on Codesys.....	(26)
Design of Flame Detection System for Pulverized Coal Boiler Based on Embedded Image Recognition	(28)
Study on Unstable Deformation Control Technology of Tensile Skin of Side Wall of Railway Vehicles	(30)
Research on Key Links of Quality Control in NC Machining	(32)
Research on Life Test of a Small Turbojet Engine for UAV	(33)
Finite Element Static Analysis of BAJA Frame	(35)
Research and Analysis of Emission Fuel Consumption Data of Light Country Five Diesel Vehicles	(37)
Development of Teaching Type Longmen Planer	(41)
Kinematics and ADAMS Simulation of Lower Extremities	(43)
Research On the Design of Bus Handrail.....	(45)
Research on Precision Air Drop Control System Based on Single Chip Microcomputer	(47)
Discussion on the Application of the Law of Conservation of Energy in Electromechanical Engineering	(51)
Research on Rotor Fault Feature Extraction Based on Correlation Coefficient Theory EMD	(54)
Pressure Resistance Simulation of Hydraulic Brake Caliper Based on Finite Element Analysis.....	(56)
Design and Manufacture of Lathe Tool Holders and Structural Finite Element Analysis	(59)
Research on Working Methods of Deep Groove Ball Bearing Assembly Machine	(61)
Research on Key Technology of Direct Drive High Efficiency Permanent Magnet Motor for Railway Locomotive	(63)
The Design of Electronic Ankle for Disabled	(64)
Control Principle Analysis and Application Research of Advanced Regenerative Combustion System	(66)
Design of Double Precision Electronic Scale Based on AT89S52 Single-chip Microcomputer	(67)
Research on Detection and Fault Diagnosis Based on Integration of Construction Machinery	(69)
Design of Electric Signal Control Device Based on Pneumatic Feedback.....	(70)
Research on the Strategies of Battery Maintenance and Retrofit of FANUC Oi-MD Numerical Control System	(72)
Research on Multi-functional Logistics Support Vehicle Design Scheme	(73)
Design Research Based on Numerical Control Equipment System	(75)
Study on Calculation Method of Viscosity of EMU Gearbox	(77)
Discussionon the Green Design and Manufacture of Hydraulic System	(79)
Thinking of Innovative Free Design of Mechanical Parts Based on 3D Printing Technology	(80)
Non-standard Automation Equipment Design Reuse Solution Based onSolidworks PDM	(83)
• Technology and Equipment •	
Variable Volume Control of Industrial Gas-fired Heat-treatment Furnace	(86)
Optimize Welding Technology to Prevent the Welding Parts from Breaking at Low Temperature and Brittleness	(87)
Development and Application of Cryogenic Hammer Impact Sample Cryogenic Instrument	(90)

Bimonthly

No.6,2018

Total Issue No.259

Published on June 2018

Sponsor: Shandong Machinery Design
And Research Institute
Shandong Mechanical Engineering Societ

Publisher: The Periodical Office Of
Modern Manufacturing Technology
And Equipment

Editor: The Editorial Office Of
Modern Manufacturing Technology
And Equipment

Distributor: The advertising Office of
Modern Manufacturing Technology
And Equipment

International Code: ISSN1673-5587

Domestic Code: CN37-1442/TH

Advertising Agent: Shandong Machinery Mass Media Center

**The Periodical Office Of
Modern Manufacturing Technology
And Equipment**

Add: 129 JiLuo Road, Jinan

Post Code: 250031

Tel: (0531)85955168

(0531)86071981

Http://www.sdji.cbpt.cnki.net

E-mail:sdjx168@163.com

mmte@163.com

zzjsyzb@163.com

zzjsyzb@126.com

Optimization Method of Thermal Insulation Process for 2124 Aluminum Alloy Aging Forming	(91)
The Research and Application of NC Tool System in the Processing of Shaped Steel Roll	(93)
Improved Machining Process for End-cover of Automobile Engine	(95)
Problems in the Installation of Electrical Equipment in 110kV Substation Stations and Their Solutions	(97)
Initial Analysis of Fault Analysis and Diagnosis Method of Electric Sliding Door Control System	(99)
Analysis on Control Measures of Heat Treatment of Metal Materials	(100)
Analysis and Application of Failure Mode of Roller Chain in Logging Truck	(102)
Discussion on Construction and Function of Bucket Wheel Stacker and Reclaimer	(104)
Single Car Vertical Main Beam Tilts Casting Crane	(106)
Research on Common Pseudo-target Interference and Its Restraining Methods of Single Pulse Secondary Radar	(107)
Analysis of Heat Treatment Cracks in Hollow Shafts	(109)
Hidden Troubles and Preventive Measures in Coal Mine Electrical and Mechanical Transportation	(111)
Discussion on Vibration Control Method of Direct Connected Fan	(112)
Analysis of Design of CNC Machining Process Based on Teamcenter	(114)
Research on Processing Technology of Straight Tooth Involute Bevel Gears	(116)
Fault Feature Recognition of Rotating Machinery Based on Vold-Kalman Order Ratio Tracking and Energy Analysis	(117)
Wind Generator Electric Impeller Lock	(120)
Application of Welding Technology in Installation of Heat Pipes	(121)
Improvement of Hydraulic Transmission Teaching Experiment Platform	(123)
Analysis and Structure Discussion on Erosion Wear Characteristics of Hydraulic Valves	(125)
Discussion on a Control Scheme of Vehicle Solar Ventilation and Heat Dissipation System	(127)
Safety Assessment and Analysis of a 3100t Class LNG Bulk Carrier's Engine Room	(129)
Effect of Temperature Change on Machining and Measurement of Finished Parts of Compressor	(131)
Production Capacity Improvement and Optimization of Priming Drug Production Line	(133)
Discussion and Practice of Maintenance and Maintenance of Central Air Conditioning System in High-Speed Railway Hub Stations	(135)
Study on Common Defects and Exclusion Measures of Marine Turbine Inspection	(138)
Nuclear Power Station Pneumatic Stop Valve Common Faults and Maintenance	(140)
The Temperature Measurement Algorithm of Uncooled Infrared Thermal Imager	(141)
High Speed Machining Technology	(143)
Discussion on Maintenance Techniques of Chemical Instrumentation	(144)
Typical Fault Analysis and Maintenance Countermeasures of Automobile Engine	(146)
A Brief Discussion on the Control Technology of the Noise in the High-speed EMUs 婷	(148)
Application Status and Development Trend of Multi-axis NC Machining Technology	(151)
The Causes and Countermeasures of Noise Disturbing of a Converter Station	(153)
Causes and Preventive Measures of Common Waste Products During Turning Threads	(154)
Electrical Control Analysis and Fault Treatment of Overhead Traveling Crane	(156)
On the Welding Technology and Countermeasures of Pressure Vessel	(158)
Research on the Processing and Development Trend of NC Lathe Tool	(159)
Discussion on the Application and Implementation of Remanufacturing Technology of Coal Mine Underground Transportation Equipment	(161)
Analysis of Application of Embedded System in Medical Equipment	(162)
Air Compressor Waste Heat Recovery Energysaving Reform	(164)
Analysis of Control Measures for Deformation in Pressure Vessel Manufacturing Process	(165)
Study on the Opening Pressure Reduction of a Certain Type of Pressure Switch	(167)
· Automation and Control ·	
Intelligent Transformation of Remote Control of Air Compressor	(168)
The Technology of Industrial Robots for Pipe Connecting Parts on Feeding and Unloading Materia	(170)
Application of Electric Automation in Stereoscopic Garage Installation	(172)
· Industry exchange ·	
Analysis of the Influence of Shared Bikekeys in Urban Development	(174)
The Research and Exploration of Training of Practical Ability in the Underground Water Supply and Drainage Construction Post	(177)
Research on the Construction of Practical Teaching System for NC Talents Training in Higher Vocational Colleges	(178)
Full-cycle Quality Control of Heat Treatment Parts for Aerospace Products	(180)
Analysis of Simulation Training Mode Based on Inventor Software	(181)
Research and Explore the Reform of Metalworking Practice Teaching Based on Product	(183)
Extensible Three-dimensional Parking Garage	(185)
Research on the Construction of Teaching Resources in the Course of CNC Turning Programming and Machining Based on Action-oriented Teaching Model	(187)
Study on Operation Characteristics and Application of Air Source Heat Pump Water Heater	(189)
“Leaving the Shopkeeper” —— Feasibility Study on Shared Lockers	(191)