



ELECTRIC WELDING MACHINE  
焊接•切割•焊材•工艺•资讯



CSTPC  
S O U R C E  
中国科技论文引文统计源期刊  
(中国科技核心期刊)

中文核心期刊

2014

1

第44卷  
总第320期

成都电焊机研究所主办

网址 <http://www.toweld.com>

# Panasonic

## 工欲善其事 松下电焊机

追求 Only one 的松下焊接技术



Full DIGITAL

400GE2



MIG/MAG脉冲铝焊机

350GL3



MIG/MAG脉冲焊机

350GR3



CO<sub>2</sub>/MAG焊机



焊接电源融合型机器人

ISSN 1001-2303

01>



9 771001 230147

万方数据

唐山松下产业机器有限公司

地址:河北唐山高新技术产业园区庆南道9号

电话: (0315) 3206060 3206066

传真: (0315) 3206018 3206070

敬请登陆 <http://pwst.panasonic.cn>

E-mail:sales@tsmi.com.cn



# 超宇焊机 融合世界

- 国家高新技术企业
- 湖南省著名商标
- H型钢生产线专业生产厂家



数控切割机专用等离子切割电源



H型钢龙门焊生产线



重型龙门数控切割机生产线



小型龙门数控切割机生产线

# 電焊機®

2014.1 (第44卷 总第320期)

## 目 次

### ■ 重点关注

- |    |   |
|----|---|
| 1  | 氟碱型烧结焊剂的电弧、冶金特性及其应用 ..... 孙 咸               |
| 5  | 工业焊接机器人空间定位技术研究 ..... 朱加雷 等                 |
| 9  | 基于高斯热源的钢轨气压焊火焰加热温度场数值模拟及加热器优化设计 ..... 江俊志 等 |
| 15 | 天然气切割应用于重型矿山装备制造的可行性 ..... 肖德政 等            |
| 18 | 磁控旋弧管板对焊激磁线圈径向磁场的简化算法 ..... 熊飞飞 等           |
| 22 | 基于法拉第磁光效应的大电流测量技术 ..... 朱卫安 等               |
| 26 | 基于热流分析的搅拌摩擦焊接工艺参数 ..... 冯天涛 等               |
| 31 | 电焊设备的安全检查 ..... 王水成                         |

### ■ 焊接设备

- |    |  |
|----|--|
| 34 | 一种基于Buck软换流型DC-DC电路脉冲TIG焊机 ..... 汪殿龙 等 |
| 39 | 带专家系统的H型钢焊接专机的研制 ..... 李 铜 等           |
| 43 | 半桥型弧焊逆变电源的建模与仿真 ..... 常利建 等            |
| 47 | 汽车减振器储油缸三枪同步焊接机床设计 ..... 卞金玉 等         |
| 51 | 变截面薄壁铝合金长管件的焊接装置 ..... 翟立帆             |
| 54 | 基于DSP的数字化软开关弧焊电源 ..... 白宏伟 等           |

### ■ 焊接工艺

- |    |  |
|----|--|
| 57 | 边界散热条件对TC4线性摩擦焊接温度场的影响 ..... 李文亚 等           |
| 60 | 轨道车辆不锈钢波纹板缝焊工艺 ..... 肖雪峰 等                   |
| 63 | 微变形激光熔敷焊接工艺和焊接残余应力研究 ..... 邓 萍 等             |
| 68 | 基于正交试验的漆包线铜箔单面逆变点焊工艺参数优化 ..... 王 健 等         |
| 73 | 不同处理工艺对A7N01S-T5铝合金焊接接头残余应力的影响 ..... 樊云杰 等   |
| 77 | 奥氏体不锈钢带极电渣堆焊层金属显微组织分析 ..... 杨 劲 等            |
| 81 | 基于Labview的CO <sub>2</sub> 焊接工艺参数优化 ..... 韩 喆 |
| 84 | 动力电池外壳激光高速焊接工艺 ..... 许为柏                     |
| 87 | Q345D钢埋弧焊接头组织与性能 ..... 杨 克 等                 |

### ■ 焊接管理

- |    |                               |
|----|-------------------------------|
| 91 | 超大型海洋钢结构焊接质量检验与控制 ..... 孙 钟 等 |
|----|-------------------------------|

中文核心期刊

中国科技论文统计源期刊（中国科技核心期刊）

《中文核心期刊（遴选）数据库》收录期刊

英国《科学文摘》（INSPEC）来源期刊

俄罗斯《文摘杂志》收录期刊

美国《剑桥科学文摘》（CSA）收录期刊

美国《乌利希期刊指南》收录期刊

波兰《哥白尼索引》（IC）收录期刊

《中国科学引文数据库》来源期刊

《机械制造文摘——焊接分册》收录期刊

《中国期刊网》入网期刊

四川省优秀期刊

四川省期刊质量考评技术类质量一级期刊

“万方数据资源系统数字化期刊群”入网期刊

《中国学术期刊（光盘版）》入编期刊

《中文科技期刊数据库》入编期刊

《中国期刊全文数据库（CCJFD）》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

《CAJ-CD规范》执行优秀期刊

台湾《华艺数位CEPS》收录期刊

“中国科技论文在线”收录期刊

.....

**湖南超宇科技有限公司**

地址：湘潭市北二环先锋工业园区

电话：0731-58289718 13574090999

传真：0731-58289718

网址：[www.xtchaoyu.net](http://www.xtchaoyu.net)

万方数据

# Electric Welding Machine

## Contents

### Important Issues

Characteristics of welding arc and metallurgical fluorine base type sintered flux and its application SUN Xian .....	1
Study on spatial location technology of industrial welding robot ZHU Jia-lei <i>et al</i> .....	5
Numerical simulation on temperature field of flame heating process of rail gas pressure welding and optimization design of heater based on Gaussian heat source JIANG Jun-zhi <i>et al</i> .....	9
Feasibility of applying natural gas cutting on fabrication of mining heavy equipment XIAO De-zheng <i>et al</i> .....	15
Simplified algorithm of radial magnetic field of exciting coil for tube to plate MIAB welding XIONG Fei-fei <i>et al</i> .....	18
Experimental study on high current measuring based on the Faraday magneto-optic effect ZHU Wei-an <i>et al</i> .....	22
Welding parameters based on thermal and fluid analysis model for friction stir welding FENG Tian-tao <i>et al</i> .....	26
Electric welding equipment's security inspection method WANG Shui-cheng .....	31

### Welding Equipment

A type of pulse TIG welding power supply based on Buck DC-DC circuit integrated soft current-change technology WANG Dian-long <i>et al</i> .....	34
Study on the special welding machine with expert system used for H-shaped steel welding LI Tong <i>et al</i> .....	39
Modeling and simulation of arc welding inverter based on half bridge rectifier CHANG Li-jian <i>et al</i> .....	43
Design of three-gun synchronous welding machine tool for oil storage cylinder on auto shock absorber BIAN Jin-yu <i>et al</i> .....	47
Study on a welding equipment for long tapered thin aluminum pipe ZHAI Li-sa .....	51
Study on digital welding soft switching power supply based on DSP BAI Hong-wei <i>et al</i> .....	54

### Welding Technology

Influence of the boundary conditions of heat radiation to TC4 temperature field of linear friction welding LI Wen-ya <i>et al</i> .....	57
Study on tests of seam welding process in stainless steel corrugated plate of railway vehicles XIAO Xue-feng <i>et al</i> .....	60
Research on micro-deformation of laser cladding welding process and welding residual stress DENG Ping <i>et al</i> .....	63
Optimization of process parameters for one-side welding enameled wire to copper foil with spot welding inverter based on orthogonal experiment WANG Jian <i>et al</i> .....	68
Research on the influence of different treatment processes to residual stress of A7N01S-T5 aluminum welding joints FAN Yun-jie <i>et al</i> .....	73
Microstructure analysis on materials of ESW with austenitic stainless steel YANG Qin <i>et al</i> .....	77
Optimization of CO <sub>2</sub> welding process parameters based on Labview HAN Zhe .....	81
Study on high-speed laser welding process of battery case XU Wei-bai .....	84
Microstructure and Mechanical property of welded joint of Q345D steel by SAW YANG Ke <i>et al</i> .....	87

### Welding Management

Weld inspect technology & quality control of ultra-large offshore steel structure SUN Zhong <i>et al</i> .....	91
---	----

Monthly Number 1 2014 Vol.44

( Total Number 320 Since 1971 )

### Sponsor

Chengdu Electric Welding Machine Research Institute  
of MMBI

### Editor & Publisher

Chengdu Electric Welding Machine Magazine Co., Ltd.

### Proprieter

YIN Xian-hua

### Chief Censor

WANG Fu-sheng

### Chief Editor

PENG Ya-ping

### Publication Scope

Publishing at Home and Abroad

### Domestic Unified Periodical Code

CN 51-1278 / TM

### International Standard Periodical Code

ISSN 1001-2303

### International Issue Code

M6662

### National Serial Code

62-81

### Price

RMB10

### Advertisement License No.

5101034000073

### Domestic Circulation

Sichuan Bureau for Distribution of Newspaper and Journals

### Overseas General Circulation

China International Books Trade Company  
( Box 339, Beijing )

### Address

No.29, Dongyiduan Erhuan Road  
Chengdu China

### Zip Code

610051

### Chief Editor Office

PENG Ya-ping +86-28-83267608

### Editorial Department

ZENG Run-ping +86-28-83289008

### Advertisement Department

FAN Hong-rong +86-28-83282678

### Network Department

LIU Ying +86-28-83278528

### Distribution Department

HUANG Xiu-yan +86-28-83267908

### Fax

+86-28-83262878

### Website

<http://www.71dhj.com> <http://www.toweld.com>

### E-mail

bj@toweld.com cddhjzs@mail.sc.cninfo.net



上海东升焊接集团  
SHANGHAI DONSUN WELDING GROUP

科技东升 引领未来

# 中国焊机顶级品牌



上海东升焊接集团有限公司

工厂地址:上海市奉贤区叶庄公路111-121号

万方数据

邮发代号: 62-81 国内统一连续出版物号: CN51-1278/TM 定价: RMB10.00元

电话: 86-21-57467222 86-21-57467333

传真: 86-21-57460055

邮编: 201415

网址: [www.sh-donsun.com](http://www.sh-donsun.com)