

# 煤矿安全

## SAFETY IN COAL MINES

ISSN 1003-496X  
CN 21-1232/TD

5  
2017

Vol. 48 No. 5

煤科集团沈阳研究院有限公司

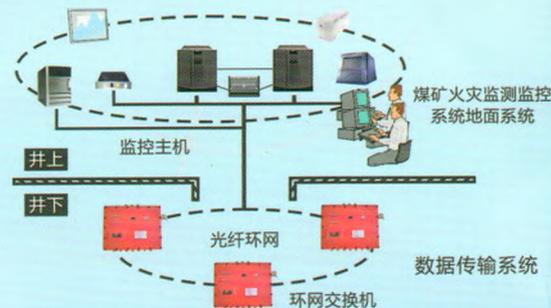
主办

1970年创刊·月刊

### GLTECH

光力科技  
股票代码: 300480

## 矿用分布式激光火情监测系统



- ◎ 最完善的火灾预测模型，包含温度、CO、CH<sub>4</sub>、C<sub>2</sub>H<sub>4</sub>、C<sub>2</sub>H<sub>2</sub>、O<sub>2</sub>、CO<sub>2</sub>，集分布式光纤传感和激光多气体检测技术为一体。
- ◎ 气体检测采用高分辨率激光吸收光谱技术，消除气体交叉干扰，测量不受粉尘、水汽的影响。
- ◎ 温度检测采用光纤传感技术，本质安全，铺设简单，无需维护，测量准确，可对采空区发火点精确定位。
- ◎ 本地实时连续测量，响应速度快，不受管路影响。

ISSN 1003-496X



9 771003 496176

万方数据

WWW.GLTECH.CN

TEL: 0371-6785 8887 E-MAIL: info@gltech.cn CSH: 400-0057-577

ADD: 郑州高新技术产业开发区长椿路十号。

# 煤矿安全<sup>®</sup>

MEIKUANG ANQUAN

月刊(1970年创刊)

2017年5月

第48卷第5期(总第514期)

## 主管单位

煤科集团沈阳研究院有限公司

## 主办单位

煤科集团沈阳研究院有限公司

主 编 罗海珠  
副 主 编 梁绍权  
编辑部主任 王福厚  
广告发行主管 刘明智

出版单位 《煤矿安全》编辑部  
地 址 辽宁省抚顺市经济开发区  
滨河路11号  
邮政编码 113122  
电 话 (024)56616988 56616987  
56616981 56613526  
电子信箱 mkaq@163.com  
mkaqgg@163.com(广告)  
网 址 www.mkaqzz.com  
发行范围 公开发行  
发行单位 《煤矿安全》编辑部  
或全国各地邮局  
邮发代号 8-293  
印刷单位 煤炭科学研究总院抚顺分院  
胶版印刷厂

中国标准连续出版物号 ISSN 1003-496X  
CN 21-1232/TD  
企业法人营业执照注册号 210400000026129  
商标注册证 第1144537号  
出版日期 5月20日  
定 价 20.00元  
北京联络处 (010)64464228

# 目 次

## 试验·研究

- 穿层水力造穴钻孔瓦斯抽采效果数值模拟研究 郝从猛,刘洪永,程远平(1)
- 工作面前方承压抽采钻孔瓦斯渗透规律及其层理效应研究 田坤云,付江伟(5)
- 煤矿井下新型瓦斯含量定点取样装置研究 李 祝,段 渊,解锡超(9)
- 非金属管材静电火花引燃瓦斯影响因素的试验研究 张绪雷,杨华运,孔令刚(12)
- 酸液改性煤的瓦斯吸附规律试验研究 周春杰,杨小彬(15)
- 煤矿井下定向钻孔施工测量精度验证与应用 黄寒静(19)
- 基于吸附势理论的低温环境煤甲烷吸附等温线预测 马向攀,王兆丰,任浩洋(22)
- 外部条件对煤粉爆炸特性的影响 池秀文,岳远洋(26)
- 相似材料中煤粉粒径对水力压裂影响的试验研究 张 帆,马 耕,刘 晓,冯 丹(29)
- 综采工作面煤尘扩散规律的研究 隋秀华,王凤娇,曾现伟,黄云前,曹冬冬(33)
- 高吸水性树脂对煤的阻燃性能实验研究 钟 演,杨胜强,刘 俊,胡新成(37)
- 恒温解吸附煤样低温氧化特性试验研究 金永飞,闫旭斌,岳宁芳,蒋志刚(41)
- 断层落差对逆断层活化规律影响的模拟研究 包 冉,李 凯(46)
- 基于弹性基础梁模型的来压步距确定 陈 磊(49)
- 逆断层两盘开采诱发顶底板及断层应力变化规律的试验研究 赵亚鹏,张培森,武守鑫(53)
- 层状岩体圆形巷道破坏特征及锚固支护对比试验研究

洛 锋,王 凯,李海江,崔景昆,郭利军,张 浩(57)

- 松软煤体巴西劈裂试验研究及应用 林 峰,荣浩宇(61)
- 采动影响下饱和松散土体运移演化过程及力学参数研究 李 柱,谢 锋(64)
- 单容器摩擦提升机防滑安全研究 胡婷婷,谢丽蓉,穆塔里夫·阿赫迈德,常一峰,高 磊(69)

## 技术·创新

- 浅埋深煤层采空区注氮防火技术 刘玉良,彭宝山,蒙文军,刘立仁,王伟东(73)
- 高瓦斯煤层液态CO<sub>2</sub>致裂消突巷道快速掘进技术 任志成,杜 刚,年 军(77)
- 被保护层综采工作面安全回采瓦斯治理技术 刘 程(81)
- 高突矿井深孔预裂爆破瓦斯“零”超限技术 彭世龙,饶 孜,江 浩,江向洋,白 鑫(84)
- 薄煤层工作面瓦斯治理关键技术 曲 宝(89)
- 煤矿火区影响下极近距离煤层掘进防火技术 刘明智(92)
- 近距离煤层上覆采空区自然发火治理技术 伍好好(95)
- 露天煤矿层状岩体顺层边坡失稳机理与控制开采技术 祖国林(98)

## 设计·开发

- 瓦斯抽采定向长钻孔智能设计方法及系统 马国龙(103)
- 隔绝式自救器安全性能比较及对相关标准的解读 马善清(107)
- 矿用混合式空冷器的热工计算 陈 柳,姚青利(111)
- ZFY7800/17/32D型两柱放顶煤支架的研制 马端志(114)
- ZMK5530TZJ60型车载钻机的研制 凡 东(117)
- 基于IEC 61850的井下智能变电站分布式母线保护方案 刘建华,唐润恒,赵纪峰,刘晓丹,李 根(120)
- 露天矿山灾害及环境远程监测系统 魏景新,靳文涛,黎 冠(123)
- 煤矿用防爆车辆动力控制装置设计改进 杨 希(127)

期刊基本参数:CN 21-1232/TD \* 1970 \* m \* A4 \* 248 \* zh \* p \* ¥20.00 \* □ \* 67 \* 2017-05



“煤传”数字数据

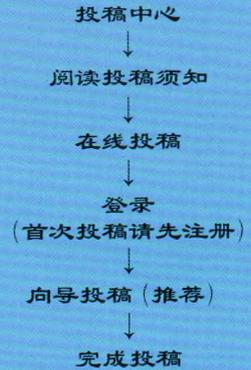
《煤矿安全》微信公众号

《煤矿安全》杂志唯一投稿平台:

www.mkaqzz.com



### 投稿流程:



### 查稿流程:



注: 投稿请用IE浏览器

## 本刊声明:

- ☆ 本刊所有来稿自投稿之日起3个月内未收到“稿件采用通知书”, 作者可另行处理, 在此之前请勿一稿多投。
- ☆ 根据编辑加工原则, 本刊可能会对采用的稿件进行必要的删改, 不同意删改的, 请在投稿时声明。
- ☆ 本刊有出电子版、网络版、与网站技术交流和与各数据库合作的权利, 作者著作权使用费(包括上述几种方式), 并与本刊稿酬一次性付清。如作者不同意将文章以上述形式收录, 请在来稿时声明。

基于计算机视觉的带式输送机跑偏监测 王 星, 白尚旺, 潘理虎, 陈立潮, 张英俊(130)  
 煤矿斜井常闭式防跑车装置设置 孙俊彦(134)

### 应用·实践

多源信息融合在煤矿瓦斯监测中的应用 张保东(137)  
 优化神经网络模型在瓦斯涌出预测中的应用 宿敬肖, 王 政, 杨静宜, 彭丽叶(140)  
 特厚煤层综放工作面封闭火区治理 常 源, 王志权, 武腾飞, 薛世鹏, 徐 利(144)  
 特厚无烟煤层瓦斯立体抽采规律及效果研究 周 波, 程建圣(147)  
 定向钻进技术在煤层顶板软弱岩层疏放水中的应用 王 庆, 刘卫卫, 崔岩波, 王丹莉(152)  
 非对称锚网支护技术在窄煤柱沿空掘巷中的应用 付建华, 韩小冰, 李红行, 张建甫, 丁喜明(155)  
 露天煤矿残煤自燃区边坡控制开采方案 赵 雪(159)

### 分析·探讨

唐山矿西南区瓦斯地质因素分析及涌出量预测 陈居凯, 张闯辉, 李拯宇(162)  
 突出矿井采空区侧向瓦斯卸压带分布特征 上官明磊, 彭小亚, 王 军(165)  
 高瓦斯矿井立井揭煤应力分布模拟及防突措施研究 仇海生(169)  
 煤矿区煤层气抽采效果检测指标及评价 孙四清(173)  
 煤层注浆压裂裂隙形成规律数值模拟 刘 超, 程 成(177)  
 含水煤层瓦斯抽采的气-液-固耦合数值模拟 张 蓓(180)  
 高压空气爆破致裂效果影响因素分析 汪开旺(184)  
 高矿化度顶板水地巷联合瞬变电磁法探测 王 鹏(187)  
 近直立特厚煤层分层开采受小窑发火影响评估 赵亚明, 孙雪亮, 龙在海, 付 晶, 张 林(191)  
 正态云模型在煤巷围岩稳定性分类中的应用 雷武林, 周华龙, 姜思阳, 余 岚, 何姜毅(194)

煤厚变化对冲击地压影响的数值模拟分析 王 勇, 杨 毕, 邓 川, 张进红, 鲁 蒙, 黄家远, 谢春妹, 黄 兴(198)  
 基于围岩变形破坏特征的煤矿地应力场主应力方向预测方法 关金锋, 崔洪庆, 王雨婷(202)  
 采动影响下底板应力分布特征及底鼓发生机理 郝彬彬, 李国栋, 洛 锋(206)  
 倾斜煤层底板破坏深度主控因素敏感性分析 李 可, 张进红(210)  
 基于数据分析的无人化工作面生产模式研究 符大利(214)  
 小波分解下煤矿立井爆破振动信号 Hilbert 谱分析 付晓强, 杨立云, 陈 程, 陈帅志, 陈岐范, 史国利(217)  
 边坡雷达监测预警机制及应用实例分析 韦忠跟(221)

### 监察·管理

基于ISM法的煤矿井下班组安全氛围影响因素分析 黄 佳, 卢明银, 王 苗, 祝宇航(224)  
 事故下降背景下山西某地方煤矿事故分析及防治对策研究 张叶馨, 栗继祖(228)  
 基于Fuzzy-AHP的煤矿生产安全风险集成管理水平研究 王爽英(232)  
 基于结构方程模型的煤矿企业安全文化影响因素研究 李永卉, 林海飞, 王振平, 王永胜, 于晓波(236)  
 基于熵权物元可拓模型的煤矿职工不安全行为评价 黄 萍, 徐晶晶(240)  
 BBS对采煤工安全心理的改善 于 跃, 栗继祖, 冯国瑞, 王天日, 刘效广(244)

# SAFETY in COAL MINES

Monthly( Started in 1970)

May 2017

Vol.48, No.5(Total 514)

## Competent Authority

CCTEG Shenyang Research Institute

## Sponsor

CCTEG Shenyang Research Institute

Chief Editor LUO Haizhu

Deputy Chief Editor LIANG Shaoquan

Editorial Director WANG Fuhou

Advertisement & Distribution LIU Mingzhi

Publisher Editorial Office of  
《SAFETY in COAL MINES》

Address No.11 of Binhe Road, Fushun  
Economic Developing-area, Liaoning, China

Post code 113122

Tel 86-24-56616988 56616987  
56616981 56613526

E-Mail mkaq@163.com  
mkaqgg@163.com(advertisement)

Website www.mkaqzz.com

Issuer Public Offering

Subscribe(to) Editorial Office of 《SAFETY in  
COAL MINES》 or Local Post Offices

Postal Distribution Code 8-293

Printed by Offset Printing Factory of  
Fushun Branch of CCRI

China Standard Serial  
Numbering ISSN 1003-496X  
CN 21-1232/TD

Business License No. 210400000026129

Trademark Registered  
Certificate No.1144537

Publishing Date May 20

Price 20 yuan

Beijing Liaison Office 86-10-64464228

万方数据

# CONTENTS

## Test·Research

- Numerical Simulation Study on Gas Drainage Effect by Through-beds Hydraulic Flushing Hole  
**HAO Congmeng,LIU Hongyong,CHENG Yuanping(1)**
- Study on Gas Seepage Laws and Bedding Effect for Pressure-bearing Drainage Boreholes in Front of the Working Face  
**TIAN Kunyun,FU Jiangwei(5)**
- Study on New Spot Sampling Device of Gas Content in Coal Mine Underground  
**LI Zhu,DUAN Yuan,XIE Xichao(9)**
- Experimental Study on Effect Factors of Gas Ignited by Nonmetallic Tubing Electrostatic Sparks  
**ZHANG Xulei,YANG Huayun,KONG Linggang(12)**
- Experimental Study on Gas Adsorption Laws of Acid Modified Coal Samples  
**ZHOU Chunjie,YANG Xiaobin(15)**
- Application and Detection of Measurement Precision for Directional Drilling Construction in Underground Coal Mine  
**HUANG Hanjing(19)**
- Prediction for CH<sub>4</sub> Isothermal Adsorption Curve of Coal at Low Temperature Based on Adsorption Potential Theory  
**MA Xiangpan,WANG Zhaofeng,REN Haoyang(22)**
- Influence of External Conditions on Explosion Characters of Coal Dust  
**CHI Xiuwen,YUE Yuanyang(26)**
- Experimental Study on Effect of Coal Partical Size on Hydraulic Fracturing in Similar Materials  
**ZHANG Fan,MA Geng,LIU Xiao,FENG Dan(29)**
- Study on Coal Dust Diffusion Laws at Fully Mechanized Coal Mining Face  
**SUI Xiuhua,WANG Fengjiao,ZENG Xianwei,HUANG Yunqian,CAO Dongdong(33)**
- Experimental Research on Super Absorbent Polymer in Fire-proof Performance of Coal  
**ZHONG Yan,YANG Shengqiang,LIU Jun,HU Xincheng(37)**
- Experimental Study on Low Temperature Oxidation of Desorption Coal in Constant Temperature  
**JIN Yongfei,YAN Xubin,YUE Ningfang,JIANG Zhigang(41)**
- Simulation Study on Effect of Fault Throw on Activation of Inverse Fault  
**BAO Ran,LI Kai(46)**
- Determination of Weighting Interval Based on Elastic Foundation Beam Model  
**CHEN Lei(49)**
- Experimental Study on Stress Change Laws of Roof and Floor and Fault Induced by Two Panels Mining of Reverse Fault  
**ZHAO Yapeng,ZHANG Peisen,WU Shouxin(53)**
- Experimental Study on Deformation and Failure Characteristics of Circle Roadway and Anchorage Support Contrast in Layered Rock Mass  
**LUO Feng,WANG Kai,LI Haijiang,CUI Jingkun,GUO Lijun,ZHANG Hao(57)**
- Experimental Study on Soft Coal Brazilian Split and Application  
**LIN Feng,RONG Haoyu(61)**
- Research on Migration Evolution Process and Mechanical Parameters of Saturated Loose Soil Under the Influence of Mining  
**LI Zhu,XIE Feng(64)**
- Research on Anti-slip and Safety of Single Container Friction Hoist  
**HU Tingting,XIE Lirong,Mutellip Ahmat,CHANG Yifeng,GAO Lei(69)**

## Technology·Innovation

- Goaf Nitrogen Injection Fire-fighting Technology of Shallow Buried Depth Coal Seam  
**LIU Yuliang,PENG Baoshan,MENG Wenjun,LIU Liren,WANG Weidong(73)**
- Research on Gateway Quick Driving by High Pressure Liquid CO<sub>2</sub> Fracturing and Outburst Removing Technology in High Gas Seam  
**REN Zhicheng,DU Gang,NIAN Jun(77)**
- Gas Control Technology for Safety Mining at Fully Mechanized Working Face in Protected Seam  
**LIU Cheng(81)**
- Gas "Zero" Overrun Technique in High Gas Outburst Mine by Deep-hole Pre-splitting Blasting  
**PENG Shilong,RAO Zi,JIANG Hao,JIANG Xiangyang,BAI Xin(84)**
- Key Technology of Gas Control at Working Face of Thin Coal Seam  
**QU Bao(89)**
- Fire Preventing and Extinguishing Technology for Very Close Seam Driving Under the Influence of Coal Mine Fire Area  
**LIU Mingzhi(92)**
- Comprehensive Control Measures for Spontaneous Combustion in Overlying Goaf in Close Distance Coal Seams  
**WU Haohao(95)**
- Instability Mechanism of Bedding Slope of Opencast Coal Mine Stratified Rock Mass and Control Mining Technology  
**ZU Guolin(98)**

## Design·Development

- Intelligent Design Method and System for Long Directional Gas Drainage Drilling  
**MA Guolong(103)**
- Safety Performance Comparison of Isolated Type Self-rescuer and Interpretation of Relevant Standard GB  
**MA Shanqing(107)**
- Thermodynamic Calculation for Mine-used Mixed Type Air Cooler  
**CHEN Liu,YAO Qingli(111)**
- Development of ZFY7800/17/32D Type Two-leg Top Coal Caving Supports  
**MA Duanzhi(114)**
- Development of ZMK5530TZJ60 Type Mobile Rig  
**FAN Dong(117)**
- Distributed Busbar Protection Scheme of Underground Intelligent Substation Based on IEC 61850  
**LIU Jianhua,TANG Runheng,ZHAO Jifeng,LIU Xiaodan,LI Gen(120)**
- Remote Monitoring System for Disaster and Environment of Surface Mine  
**WEI Jingxin,JIN Wentao,LI Guan(123)**



煤科集团沈阳研究院  
有限公司

### 系列产品

- ◆ 紧急避险系统
- ◆ 煤矿安全生产监控系统及人员定位系统
- ◆ 煤矿瓦斯抽放配套装备
- ◆ 矿井通风防火装备
- ◆ 煤矿瓦斯基础参数测定仪器
- ◆ 矿山救护装备
- ◆ 低压供电系统配套装备
- ◆ 矿用钻机及配套装置
- ◆ 露天矿卡车调度系统及边坡监测装备
- ◆ 模拟仿真训练系列

立足服务

保障安全

依靠创新

共同发展

WWW.SYCCRI.COM

辽宁 抚顺 经济开发区滨河路11号  
T 024-56616909 F 024-56616800

辽宁 沈阳 东滨河路108号  
T 024-24117298 F 024-24117568



Design Improvement for Explosion Proof Vehicle Power Control Device of Coal Mine YANG Xi(127)  
Deviation Monitoring of Belt Conveyor Based on Computer Vision  
WANG Xing,BAI Shangwang,PAN Lihu,CHEN Lichao,ZHANG Yingjun(130)  
Setting of Normally Closed Type Anti-tram Running Device in Inclined Shaft of Coal Mine  
SUN Junyan(134)

#### Application·Practice

Application of Multi-source Information Fusion and Knowledge Discovery in Coal Mine Gas Monitoring  
ZHANG Baodong(137)  
Application of Neural Network Model Optimization in Predicting Gas Emission  
SU Jingxiao,WANG Zheng,YANG Jingyi,PENG Liye(140)  
Governance of Sealing Fire Area at Fully Mechanized Caving Face of Extra-thick Seam  
CHANG Yuan,WANG Zhiquan,WU Tengfei,XUE Shipeng,XU Li(144)  
Study on Stereo Gas Extraction Laws and Effect in Extremely Thick Anthracite Coal Seam  
ZHOU Bo,CHENG Jiansheng(147)  
Application of Directional Drilling Technology in Dredging and Draining Water of Roof Soft Rock  
WANG Qing,LIU Weiwei,CUI Yanbo,WANG Danli(152)  
Application of Asymmetric Anchor Net Support Technology in Narrow Coal Pillar Gob-side Entry Driving  
FU Jianhua,HAN Xiaobing,LI Honghang,ZHANG Jianfu,DING Ximing(155)  
Scheme of Slope Control Mining for Residual Coal Spontaneous Combustion in Surface Coal Mine  
ZHAO Xue(159)

#### Analysis·Discussion

Gas Geological Characteristics Analysis and Emission Prediction in the Southwest of Tangshan Mine  
CHEN Jukai,ZHANG Chuanghui,LI Zhengyu(162)  
Distribution Characteristics of Lateral Gas Stress Relief Zone in Gob of Outburst Mine  
SHANGGUAN Minglei,PENG Xiaoya,WANG Jun(165)  
Vertical Shaft Uncovering Coal Stress Distribution Simulation of High Gas Mine and Outburst Prevention Measures Research  
QIU Haisheng(169)  
Detection Indexes of Coalbed Methane Drainage Effect and Evaluation Method in Coal Mine Area  
SUN Siqing(173)  
Numerical Simulation of Fractures Formation Laws in Coal Seam Grouting Fracturing  
LIU Chao,CHENG Cheng(177)  
Numerical Simulation on Gas-liquid-solid Coupling Mechanism of Gas Drainage in Water-bearing Coal Seam  
ZHANG Bei(180)  
Analysis of Factors Influencing Crack Effect by High Pressure Air Blasting  
WANG Kaiwang(184)  
Detection of High Salinity Roof Water by Ground Tunnel Combined TEM  
WANG Peng(187)  
Influence Evaluation of Small Kilns Spontaneous Combustion on Slice Mining at Nearly Vertical Super-high Seam  
ZHAO Yaming,SUN Xueliang,LONG Zaihai,FU Jing,ZHANG Lin(191)  
Application of Normal Cloud Model in Surrounding Rock Classification of Coal Roadway  
LEI Wulin,ZHOU Hualong,JIANG Siyang,YU Lan,HE Jiangyi(194)  
Numerical Simulation Analysis of Influence of Coal Thickness Change on Rock Burst  
WANG Yong,  
YANG Bi,DENG Chuan,ZHANG Jinhong,LU Meng,HUANG Jiayuan,XIE Chunmei,HUANG Xing(198)  
Prediction Method for Principal Stress Direction of In-situ Stress Field Based on Deformation and Failure Characteristics of Surrounding Rock in Coal Mine  
GUAN Jinfeng,CUI Hongqing,WANG Yuting(202)  
Floor Stress Distribution Characteristics and Mechanism of Floor Heave Under the Influence of Mining  
HAO Binbin,LI Guodong,LUO Feng(206)  
Sensitivity Analysis on Main Factors of Inclined Coal Floor Damage Depth  
LI Ke,ZHANG Jinhong(210)  
Research on Working Mode of Unmanned Mining Workface Based on Data Analysis  
FU Dali(214)  
Analysis of Hilbert Spectrum for Mine Vertical Shaft Blasting Vibration Signal Based on Wavelet Decomposition  
FU Xiaoqiang,YANG Liyun,CHEN Cheng,CHEN Shuaizhi,CHEN Qifan,SHI Guoli(217)  
Monitoring and Early Warning Mechanism of Slope Radar and Application Example Analysis  
WEI Zhonggen(221)

#### Supervision·Management

Influencing Factors Analysis of Underground Coal Mine Team Safety Atmosphere Based on ISM  
HUANG Jia,LU Mingyin,WANG Miao,ZHU Yuhang(224)  
Research on Causes and Countermeasures of a Local Coal Mine Accidents in Shanxi Province Under the Background of Falling Accident  
ZHANG Yexin,LI Jizu(228)  
Research on Integrated Management Level of Coal Mine Production Safety Risk Based on Fuzzy-AHP  
WANG Shuangying(232)  
Study on Influence Factors of Enterprise Safety Culture Based on Structural Equation Model  
LI Yonghui,LIN Haifei,WANG Zhenping,WANG Yongsheng,YU Xiaobo(236)  
Evaluation of Unsafe Behavior Based on Entropy-weight Theory and Matter-element for Coal Mine Workers  
HUANG Ping,XU Jingjing(240)  
Safety Psychology Improvement of Coal Miners by Behavior-based Safety  
YU Yue,LI Jizu,FENG Guorui,WANG Tianri,LIU Xiaoguang(244)

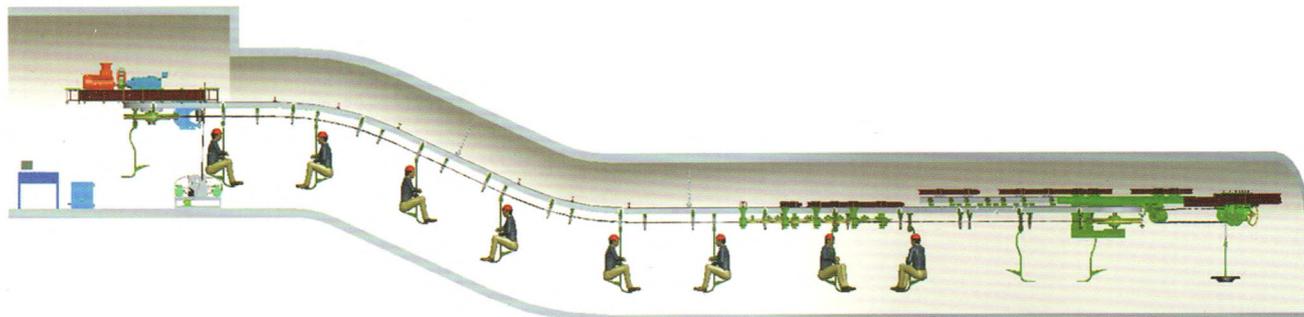
万方数据



# 湘潭市恒欣实业有限公司

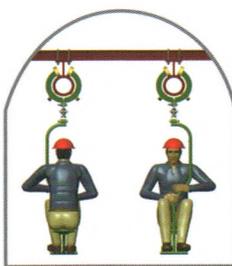
全球“猴车”科研、制造、销售、服务领军企业

## 矿用绳牵引轨道式架空乘人装置（俗称“轨道猴车”）

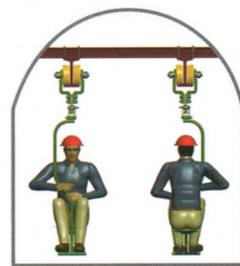


### 产品特点

不掉绳	大运量
不飞车	任意转弯
大坡度	抱索器形式简单
无托绳轮和压绳轮	物联网技术应用

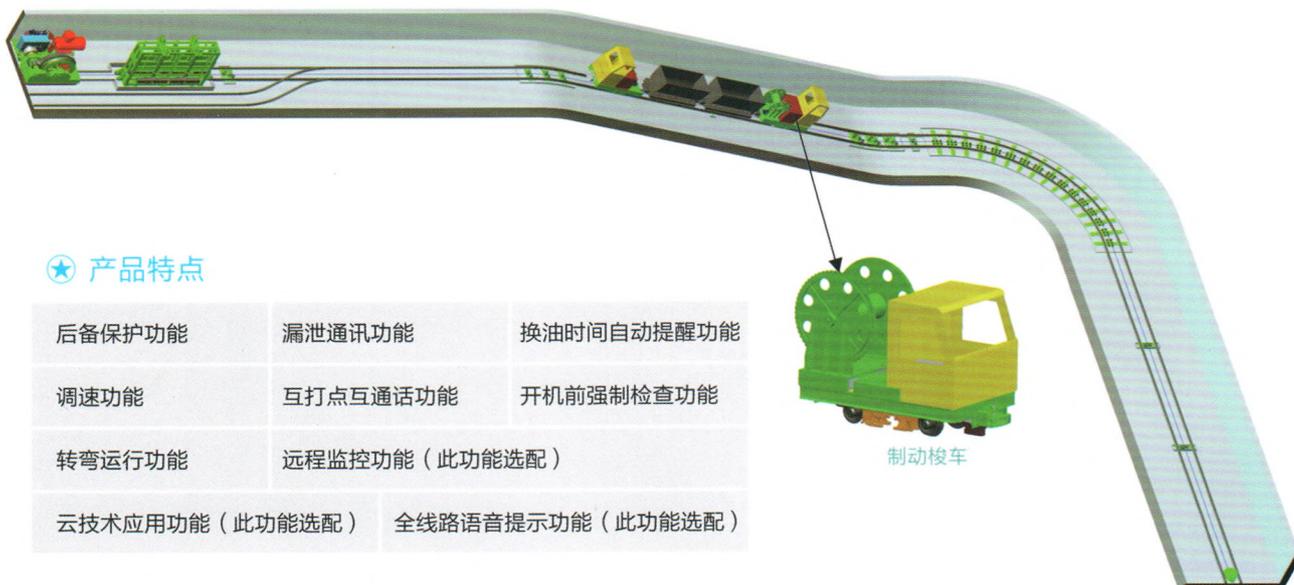


圆管轨道猴车



工字钢轨道猴车

## 矿用无极绳连续牵引车（俗称“梭车”）



### 产品特点

后备保护功能	漏泄通讯功能	换油时间自动提醒功能
调速功能	互打点互通话功能	开机前强制检查功能
转弯运行功能	远程监控功能（此功能选配）	
云技术应用功能（此功能选配）		全线路语音提示功能（此功能选配）

制动梭车

营销专线：0731-55672999 55672019  
 总机：0731-55672666  
 网址：www.hx12666.com  
 地址：湖南省韶山市高新区

售后专线：0731-55672016 55672022  
 传真：0731-55672012 55672100  
 E-mail：xiao12666@163.com  
 邮编：411300

