

节能

ISSN1004-7948

CN21-1115/TK

1
2013

ENERGY CONSERVATION

第32卷 第01期 (总第364期)



金科同力
JINKETONGLI

同心同力 / 共赢未来
CONCENTRIC WITH THE FORCE TO WIN THE FUTURE

采用「全焊接球阀」



螺栓 / 法兰 / 垫片

节约工程造价及大量物质资源

寿命长 · 宜保温 · 可直埋 · 质保20年

水力平衡产品系列



■ 动态阻力平衡阀

■ 自力式压差控制阀

■ 自力式流量控制阀



ISSN 1004-7948



0.1 >

9 771004 004

河北同力自控阀门制造有限公司

传真: 0317-8338780 网址: www.tlzkfm.com

电话: 0317-8338351 / 8338899

E-mail: tongli5188@163.com



节能 (月刊)

Jieneng

中国核心期刊(遴选)数据库全文收录期刊
中国学术期刊综合评价数据库(CAJCED)统计源期刊
中国期刊全文数据库(CJFD)全文收录期刊
中文科技期刊数据库全文收录期刊
1981年创刊 第32卷第1期(总第364期)
2013年1月15日出版

主管:辽宁省科学技术厅

主办:辽宁省科学技术情报研究所

辽宁省能源研究会

主任/主编:金娜

副主任:王建成

责编:董媛媛

编辑:高峰 佟昕 赵博

电话/传真:(024)23933125(编辑部)

(024)23940370(广告部)

电子信箱:jieneng1981@vip.sina.com

出版:《节能》杂志社 邮编:110181

地址:沈阳市高新技术产业开发区浑南二路8号

网址:www.china-energy-conservation.com

印刷:沈阳中科印刷有限责任公司

订阅:全国各地邮政局

国内发行:辽宁省邮政公司报刊发行公司

国外发行:中国国际图书贸易总公司

邮发代号:8-150 国外:M5170

刊号:ISSN1004-7948

CN21-1115/TK

广告经营许可证号:2101001500026

开户名:辽宁省科学技术情报研究所

开户行:中国建设银行沈阳建行鲁美支行

账号:21001383908052504526

定价:每期10.00元 全年120.00元

目次

综述

- 能源审计对提高能源利用效率的作用 马洪亭,黄悦,蔡景辉,等(4)
- 1951~2010年沈阳地区风速及风能资源特征分析 孙岩,林刚,郑崇伟,等(7)
- 日本新千岁航空港利用冰雪冷能的简介 郭廷杰(9)
- 提高水厂泵站配电系统功率补偿的实效性分析 李伟,田青,朱科(12)

研究与探讨

- 玉米秸秆与煤掺烧锅炉运行性能分析 张小桃,李娜,蹇浩(15)
- 内可逆矩形循环有限时间热力学分析 刘雄,陈林根,秦晓勇,等(19)
- 带游泳池的综合体育馆暖通节能设计 吕冰,赵玉清,樊曲,等(22)
- 回转窑内气固两相流传热数学模型的研究 沈春艳,翟勇,尹洪超(26)
- 基于Matlab的夹点分析法研究换热网络 郝海波,宋小磊,陈贵军(31)

电力行业节能

- 超临界四角切圆锅炉冷态空气动力场试验研究 王鹏(34)
- 1000MW火电机组给水泵组配置对机组运行的影响 沈坚,黄兆华,陈昕,等(39)
- 600MW火电机组静叶可调引风机节电模式分析 梁静宇,潘作为,郭鹏,等(43)

建筑行业节能

- 建筑节能施工过程中各主体监管调查分析 邹军,彭文武,罗清海,等(47)
- 集中供暖换热站扩容供热方式的选择 张秀娟,王国磊(51)
- 供热管网中水压图的绘制与分析应用 王夏冉,张增刚,周月琴(55)

冶金行业节能

- 高炉熔渣颗粒流态化气固换热实验研究 黄润华,张衍国,虞育松,等(58)
- 高炉鼓风机在线倒运技术应用 李蕴华(62)

石化行业节能

- 凝结水离子交换处理工艺中失效树脂的分离及再生 钟永锋(65)
- 北疆地区风光互补发电最佳配比方案的研究 胡翠华,王侃宏(69)

节能设备

- 卷烟厂蒸汽锅炉的节能运行与改造 郑东升,高宪君(72)

Energy Conservation (Monthly)
Sponsor: Liaoning Provincial Institute of Science and Technology Information
Publisher: Energy Conservation Magazine Publishing House
Chief Editor: JIN Na
Address: No. 8, Hunnan 2 Road, Shenyang high-tech industrial development zone, Shenyang City, Liaoning Province, China
Post Code: 110181

CONTENTS

Jan. 2013 Vol. 32, No. 1 Total Issue No. 364

Boiler operation performance analysis of corn straw co-firing with coal

ZHANG Xiao-tao, LI Na, QIAN Hao
(Institute of Electric Power, North China University of Water Resources and Electric Power, Zhengzhou 450011, China)

Abstract: The study on the boiler operation performance of biomass and coal co-firing can promote the rational development of biomass. Based on ASPEN PLUS software, the co-firing model of corn straw and coal were established and the process was simulated, the operation performance of boiler and the change rule of pollutants discharge were researched in different co-firing ratio and moisture content of biomass. The results show that the generated theory flue gas and the heat loss of the flue gas increase, the boiler thermal efficiency decreases along with the increase of the proportion of mixed burning compared with single combustion pulverized coal, and the gas pollutant emission mole fractions of NO and SO₂ reduce; along with the increase of biomass moisture content, NO emissions decrease but SO₂ emissions increase.

Key words: biomass energy; corn straw; co-firing ratio; water ratio; boiler performance; pollutant emission

15

Finite-time thermodynamic analysis for an endoreversible rectangular cycle

LIU Xiong, CHEN Lin-gen, QIN Xiao-yong, et al
(College of Power Engineering, Naval University of Engineering, Wuhan 430033, China)

Abstract: The performance of an air standard rectangular cycle with heat transfer loss is analyzed and the relationships between work output and the expansion ratio, as well as between the efficiency and the expansion ratio are derived by using the finite time thermodynamic theory. The relations between work output and efficiency are obtained by detailed numerical examples. The effects of the heat transfer loss and cycle parameters on the performance are analyzed. The results can provide some guidelines for the application of the rectangular cycle.

Key words: finite time thermodynamics; rectangular cycle; work output versus efficiency characteristics

19

Analysis of heat transfer model of solid-gas two phases flow in rotary kiln

SHEN Chun-yan, ZHAI Yong, YIN Hong-chao
(Dalian University of Technology, Dalian 116024, China)

Abstract: The heat transfer between the gas, bed materials and inside wall of the rotary kiln is a comprehensive thermal process. The numerical simulation is an effective method. Based on the physical and chemical properties of different positions, the kiln is divided into seven

zones to set up one-dimensional axial heat transfer model. The MATLAB programming is used to obtain the temperature distributions and energy exchange in all zones. Besides, the heat transfer mechanism in circumferential and radial direction of the kiln cross section is studied. Based on Fourier's law, the heat transfer differential equations in polar coordinates is builded, and lumped parameter method is applied to solve it. The temperature fluctuations of the kiln wall is obtained.

Key words: numerical simulation; 1D thermal transfer model; lumped parameter method; heat penetration

26

Test research on cold aerodynamic field of tangential firing boiler for supercritical units

WANG Peng
(Datang Qingyuan Co-generation Power Co. Ltd., Baoding 071000, China)

Abstract: In order to test combustion equipment manufacturing and installation quality and know about the flow characteristics of aerodynamic field of 660MW supercritical boiler with tangential firing, providing reference data for the boiler's first start and combustion conditions, a test on cold aerodynamic field is introduced. The tests include that adjusting the primary air velocity, measuring the secondary air baffle characteristics and testing the aerodynamic field. The results show that the boiler is satisfied basically with uniform air distribution in four corners on the condition that air velocity is adjusted uniformly in different jet orifices, the ideal aerodynamic field is obtained.

Key words: tangential firing boiler; baffle characteristics; aerodynamic field

34

Influence of boiler feed pump configuration on the 1000MW power plant unit operation

SHEN Jian, HUANG Zhao-hua, CHEN Xin, et al
(Central Southern China Electric Power Design Institute, Wuhan 430071, China)

Abstract: Differences among a variety of feed-water pump configuration are analysed and compared based on the 1000MW units of Hanchuan power plant feed-water pump configuration. The safety and economy of equipment operation for non-motor-driven feed-water pump configuration and the effect of boiler feed pump configuration on the unit operation are analysed.

Key words: turbine-driven feed-water pump; motor-driven feed-water pump; optimal configuration; unit operation

39

Analysis of energy saving modes on stationary blade adjustable induced-draft fans of 600MW thermal power grating unit

LIANG Jing-yu, PAN Zuo-wei, GUO Peng, et al
(School Of Electrical and Electronic Engineering, North China Electric Power University, Beijing 102206, China)

Abstract: In view of the present induced draft fan with too much safety margin and low efficiency, three methods of transformation scheme about energy saving are proposed such as non-speed control energy saving scheme, non-frequency speed control energy saving scheme and frequency speed control energy saving scheme. Taking the induced fan of NO.1 generating unit in the Inner Mongolia Tongliao Huolinhe Power Generation Company as an example, to detailed analysis and research the three methods and economic benefits, from long-term economic benefits, variable frequency regulation is practical, reliable, advanced transform scheme, the energy-saving benefit is considerable, which is effective the method to reduce energy consumption.

Key words: induced draft fan; structural transformation; hydraulic coupler; variable frequency regulation; energy saving

43

The comparative analysis of energy saving reconstruction methods of a heating area

ZHANG Xiu-juan, WANG Guo-lei
(Shandong Yingcai University,
Ji'nan 250104, China)

Abstract: A new regional's heating method of a heat transfer station is discussed. Two kinds of programs are suggested. One is indirect connection, the other is mixing heating. Giving two kinds of program design description and comparing the two programs, the mixing heat has better efficiency and effect.

Key words: heating mode; indirect heating; mixing heating; stable operation; energy saving and emission reduction

51

The drawing and analysis application of pressure diagram in heating network

WANG Xia-ran, ZHANG Zeng-gang, ZHOU Yue-qin
(School of Thermal Engineering, Shandong
Jianzhu University, Jinan, 250101, China)

Abstract: Based on brief introduction of the basic principles and functions of pressure diagram, the pressure diagram of one heating system model is plotted. And the information reflected by the pressure diagram is analysed, so that it can express the importance of pressure diagram in solving problem of heating system.

Key words: heating network; pressure diagram; hydraulic regime

55

Application of the online transportation technology in blast furnace blower

LI Yun-hua
(Xuanhua iron and steel Co. power plant,
Zhangjiakou 075105, China)

Abstract: The blast furnace blower online transportation control thought, operation mode, safe operation and other aspects are introduced in detail. Breaking the off-line transportation way in blast furnace blower is major breakthrough and worthy to popularization and application of the metallurgical industry.

Key words: blast furnace blower; transportation technology; surge control

62

Application of tower diameter changing in resin fractionation

ZHONG Yong-feng
(China Petroleum Engineering & Construction
Corporation Dalian Company, Dalian 116000, China)

Abstract: Through the heat recovery of condensation water in oil refining plant and the water treatment recycling, it can reduce the energy

consumption of production. In this project, according to the different quality of condensate water, different process is adopted. Specifically, the static oil separation process is used to remove the suspended oil in the condensation water. In addition, the emulsified oil and suspended oil adsorption, iron removal, heat recovery, the number of ion (anion and cation) and conductivity value overweight treatment, deoxygenization treatment also can be achieved. It make the index of condensation water after treatment reach deoxygenated water index, meeting the boiler feed water requirement. To ensure the effective regeneration of the failure resin, effective separation technique, equipment and control mode are adopted to deal with failure resin based on the technique of Na⁺ exchange process. So the process water is qualified and the resin recruitment reduces. Through the practical production operation, the process results reach the design requirements and achieve a satisfactory effect.

Key words: resin; separate; tower diameter changing

65

Wind and solar in the northern oilfield's best ratio program

HU Cui-hua, WANG Kan-hong
(Survey and Design Institute of Xinjiang oil
(limited company), Karamay 834000, China)

Abstract: The power structure in China is unreasonable. Based on the analysis of new energy industry in Xinjiang, the existing problems were analyzed. Using the intermediate interpolation approximation algorithm to analysis the new energy optimal matching scheme and the amount of carbon savings. Results show that, in the future development, wind energy continues to play an important part in wind and solar power generation system.

Key words: scenery complementary power generation; intermediate interpolation approximation ratio; simulation; carbon emissions

69

Energy-saving operation and reformation of steam boiler in cigarette factory

ZHENG Dong-sheng, GAO Xian-jun
(Xinzheng Cigarette Factory of China Tobacco Henan
Industrial Co. Ltd., Xinzheng 451150, China)

Abstract: Because of wide steam load fluctuating range, difficult operation and lower operation efficiency in the course of cigarette production, the operation model of energy conservation used two boiler is proposed. By means of advanced energy-saving technology, thermal deaerator was removed. The way of surface drainage is reformed, flashed steam of surface drainage and cooling water of sampling cooler recycled, great economic and social benefit are obtained.

Key words: cigarette factory; steam boiler; operation model of energy conservation; energy-saving reformation

72

企业名 录

*江苏广旭热管科技有限公司

*北京德晖炉窑有限公司

*盘锦环帮节能设备有限公司

*辽宁省锅炉技术研究所

*沈阳达源节能环保科技有限公司

*辽宁飞鸿达蒸汽节能设备有限公司

*沈阳成达节能技术有限公司