

节能

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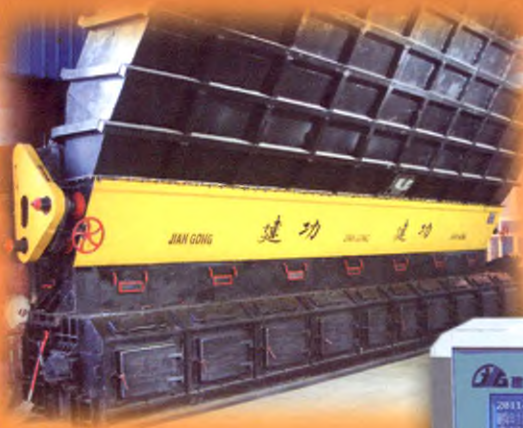
链条锅炉第七代分层燃烧技术——



SFFFG型

三辊式分层分行分段

给煤装置



30t/h单炉排分层分行分段给煤装置



MHJ—8061型智能煤耗计

1. 三辊式结构 (专利号972182721), 湿煤不粘、冻煤不棚、干煤不自流, 任何煤质条件下供煤都流畅均匀。
2. 配“可变形组合式筛分器” (专利号2006200904651), 可根据煤质状况, 在“分层燃烧”与“分行燃烧”之间任意切换, 具备适应煤种变换的能力。
3. 煤闸板根据锅炉吨位按3~12段布置, 可以对局部煤层厚度 (风阻) 做单独调节。
4. 配MHJ—8061型“智能煤耗计”, 实现单炉、单位时间煤耗量的显示、打印和数据输出。
5. 较普通煤斗相比, 平均节煤5%~10%, 投资回收期两个连续运行月之内; 较早期分层煤斗相比, 平均节煤2%~5%, 投资回收期四个连续运行月之内 (详情请见本刊第58页文章)。

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CONTENTS

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Residual-heat utilization by vapor condensation in natural gas burning process

LIU Chang-zheng, SHEN Sheng-qiang
(School of Energy and Power Engineering, Dalian University of Technology, Dalian 116024, China)

Abstract: Principle of residual-heat utilization by vapor condensation in natural gas burning process is introduced in this paper. Ingredient of natural gas combustion products is analyzed. Heat losses due to exhaust gas, amount of energy conservation and condensation rate are calculated. The results indicate that recoverable latent heat of vapor in the gas combustion products accounts for 11.2% of the low calorific value. Exhaust losses increase with the increasing of exhaust gas temperature, and when the exhaust gas temperature is below the dew point, the trend is drastic. Moreover, the vapor condensation rate decreases with the exhaust temperature rise. Characteristic of environmental protection in reducing NO_x emission is also presented.

Key words: natural gas; residual-heat utilization; energy conservation; environmental protection

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Numerical simulation on phase change energy storage performance of fatty alcohols

ZUO Jian-guo, LI Guo
(School of Energy and Power Engineering, Dalian University of Technology, Dalian 116024, China)

Abstract: By using solidification/melting model of FLUENT software, the solidification process of various fatty alcohols in energy storage ball is numerically simulated. The change of liquid fraction with time is obtained. For 1-Decanol, the effects of temperature, radius and heat conductivity on solidification time are analyzed. The conclusion of this paper can provide reference for the application of fatty alcohol in energy storage field.

Key words: phase change material; fatty alcohol; energy storage ball; FLUENT

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Study of a new environmental and energy conservation refrigerant

WANG Xiao-fei, LI Dong, GU Jian-Sheng, et al
(Yantai Dunham-Bush Industrial Company Limited, Yantai 264002, China)

Abstract: An environment friendly and energy-saving refrigerant named TJR02 is proposed in this paper for replacing HCFC-22. Its ODP and GWP are much lower than HCFC-22. Experimental results showed that the pull-down time achieved earlier using refrigerant TJR02 than using HCFC-22. It can be directly used in the system without change the original structure of equipment; it can save at least 20% energy than HCFC-22 in the long time run. Moreover, the comparative result was verified by the experiments in the standard test-bed of Sanyo Compressor Company in Dalian.

Key words: HCFC-22; TJR02; environment friendly and energy con-

servation; performance

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Modeling non-uniform airflow distribution in large grain silos using fluent

BAI Zhong-quan, LI Da-yong, GUO Zhen-yu, et al
(School of Thermal Energy Engineering, Shandong Jianzhu University, Jinan 250101, China)

Abstract: Based on Fluent software, simulate non-uniform airflow through large grain storage silos using Ergun's equation. By describing material properties of a grain mass such as porosity and fines concentration and setting mathematical models, study the air-flow process of two cases, namely peaked grain with perforated floor ventilation and leveled grain with ring duct ventilation, obtain changes of velocity and static pressure. The results showed that peaked grain with perforated floor ventilation increased the resistance in silo center vertical direction, and in leveled grain with ring duct ventilation the air flow spread along the bottom of the silo wall, leading to non-uniform airflow. Investigation for non-uniform airflow, it's significant to serve grain storage.

Key words: aeration; non-uniform airflow; Ergun's equation; peaked grain; leveled grain

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The preliminary analysis of the solar radiant energy in Zhengzhou region

LI Yu-na, MA Lei, ZHOU Jian-qiang
(Henan Zhengzhou Electric Power College, Zhengzhou 450004, China)

Abstract: the author analyzes the changes of the solar radiation of Zhengzhou region. Analysis shows that the annual solar energy resources are more abundant and relative stability, and the using potential of winter solar energy resources is very great, and direct and scattering and south to the solar radiation shall be used reasonably; that the sun total radiation of more than 100 W/m² account for 79% of the total radiation in zhengzhou region.

Key words: zhengzhou region; solar radiation; frequency distribution

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The utilization of ground-source heat pump system in Suzhou villa construction

QIAN Hua-mei
(Suzhou Institute of Trade & Commerce, Suzhou 215009, China)

Abstract: Three kinds of central air conditioning systems are commonly used in Suzhou villa construction. Their problems were discussed. According to the nature of problems co-existing in air-source heat pump air-conditioning systems, ground-source heat pump system as a solution is proposed. The forms and characteristics of ground-source heat pump system were introduced. The feasibility of ground-source heat pump system in Suzhou Villa was analyzed in an engineering application case. Good project of development and utilization of ground-source heat pump system in villa construction in Suzhou and the surrounding areas was brought forward.

Key words: ground-source heat pump; Suzhou; villa construction; engineering application

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Impact analysis of ratio of window/wall areas on superstore cooling and heating load

LI Ting, JING You-yin, CHEN Tuo-fa
(North China Electric Power University, Baoding 071003, China)

Abstract: There are some affecting factors of the building cooling and heating load. This article simulate Cooling and Heating Load of a large stores through the DeST software. The influence of ratio of window/wall areas on building cooling and heating load was mainly analyzed. Corresponding relationships and tendency curves between build-

ing load and the ratio of window/wall areas were obtained. The change trend of building load value was analyzed by the curves, and concrete mathematical relations of the change were also obtained. The analysis results can provide a certain reference value for building design.

Key words: DeST simulation; load analysis; ratio of window/wall areas; curve-fitting

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Study and examples of the analyzing methods of architectural energy consumption

LI Xiao-shan

(INOHYDRO Tianjin Engineering Co. Ltd., Tianjin 300384, China)

Abstract: Analysis of building energy consumption is the basis of building energy saving and building energy efficiency management. This paper analyzes the commonly used building energy analysis methods: The computer simulation method, degree day method, bin method, comparing the advantages and disadvantages of three methods, and briefly describes some improvements to make the results more in line with the actual situation. This provides the beneficial reference for calculation of building energy consumption and study of building energy-saving measures in the future.

Key words: energy consumption analysis; computer simulation method; degree day method; bin method; humid radiation frequency method

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Effect of Atmosphere on the Generation Capacity of TRT

XUE Yan

(Chengfa-Keneng Power Engineering Company, Chengdu 610503, China)

Abstract: The reason of the difference of generation capacity between two TRT of the same model was analyzed, through the method of theoretical calculation, on the base of TRT performance. Atmosphere conditions were found the main reason of the difference in the generation capacity of the two TRT. The difference in atmosphere pressure leads to the difference in the pressure-ratio and reduced mass-flow, which is the main reason of the difference of generation capacity between the two TRT. On the other hand, because of the difference in reduced mass-flow, the mass-flow of one of the two TRT is less than the needed maximum mass-flow. The results of this paper suggest that the effect of atmosphere should be taken into account to select a model of TRT for a blast furnace.

Key words: blast furnace; TRT; atmosphere; generation capacity; pressure-ratio; reduced mass-flow

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300MW unit seal retrofit practice and the effect

NING Zhi, ZHU Peng-An, WU Zheng-ping, et al
(Anqing Power Plant, Anqing 246000, China)

Abstract: a Anhui power plant first phase project is two 300MW class power units, the unit steam turbine is aging, thermal efficiency at generator terminals is increased, so they need to make the transformation, improve efficiency, through research conducted 1st turbine steam seal reformation of big machine, high pressure cylinder part adopts the Brandon steam seal, and low pressure cylinder adopts the honeycomb steam seal. After the transformation of coal consumption decrease in 3.12g/kWh, obvious energy saving effect.

Key words: the Brandon steam seal; the honeycomb steam seal; transformation

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Experimental research on performance test of circulating fluidized bed boiler

LI Zhen-qing, ZHANG Lu-tao, ZHAO Bin, et al
(Tangshan Institute of Special Equipment Inspection, Tangshan 063000, China)

Abstract: Circulating fluidized bed (CFB) boiler is a mature technology to realize clean coal power generation, while most of them have a low operational efficiency in the operation which directly affects the economical operation of boiler. Based on Performance Test Code for Circulating Fluidized Bed Boilers, the two 490t/h CFB boilers in Tangshan Kailuan Dongfang Power Generation Co. Ltd (Dongfang Power Plant) are taken an example; both the thermal efficiency test and the air leakage of preheater test are carried out. The calculation indicate that the thermal efficiency of 1st boiler and 2nd boiler reach 88.37% and 85.74% under the case III, which are 2.83 percentage points and 5.46 percentage points lower compared with the design working condition. The air leakage coefficient of 1st boiler and 2nd boiler are 0.156 and 0.153 which are 4 percentage points and 2 percentage points higher compared with the design working condition. The result shows that CFB boiler performance tests can provide data support for CFB boiler optimal operation.

Key words: CFB boiler; performance test; thermal efficiency; air leakage; research

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Rotating spray dust removal device by experiment and simulation

ZHANG Yan

(Building Science Research Institute of Shandong, Jinan, Jinan 250031, China)

Abstract: Coal mine production will produce a lot of dust; the main technology at present is spray! This paper introduces the design of a set of rotating spray for dust reduction system, and has the advantages of simple structure, water without the need for booster, good spray effect. Due to less number of atomizing nozzle, a relatively wide range, it compared to save water. The flow field is simulated using standard turbulence model. To predict the behavior of the spray, several other Discrete Phase Models (DPM), including collision and break-up, are used. Clearly reflects the situation of spray field and comparison with experimental.

Key words: spray; dust fall; water saving; numerical simulation

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The weight loss method of fly ash carbon measuring instrument and its existing problems and ways of improvement

WANG Tao, ZHANG Chun-long, WU Nan, et al
(Northeast Dianli University, School of Automation Engineering, Jilin 132012, China)

Abstract: The burning method of measure carbon technology is a classic method at present, taking the company development cantilevered weight-loss method of fly ash carbon instrument measured object, given its principle of work meanwhile points out the existing problems, such as components of the service long time work problems and mechanical ageing, reduce the long-term reliability of on-line monitoring. Therefore, this paper proposes a theory: Combine the neural network prediction and the fly ash carbon instrument measured. The new intelligent control mode, the machine operation has made a lot of improvement.

Key words: the fly ash carbon instrument measured; neural network; improvement techniques

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