

**96/00771 A distributed model for prediction of the transient response of an evaporator**

Jia, X. *et al.*, *Int. J. Refrig.*, Jun. 1995, 18, (5), 336-342.  
Describes a distributed parameter model for predicting the transient performance of an evaporator. The model is capable of predicting distributions of the refrigerant velocity, void fraction, temperature, tube wall temperature, air temperature and humidity, in both position and time domains.

**96/00772 Effect of powder accumulation at cohesive zone on permeability in blast furnace**

Takashima, K. *et al.*, *Nisshin Seiko Giho*, 1995, 71, 1-12. (In Japanese)  
The paper describes how in order to maintain permeability in a blast furnace at a high injection rate of pulverized coal, the effect of the cohesive zone shape on powder accumulation behaviour and of powder accumulation behaviour on permeability in a blast furnace were investigated by a two-dimensional cold-model experiment.

**96/00773 Engineering real-time systems**

Rodd, M. G. *Computing & Control Engng. J.*, Oct. 1995, 6, (5), 233-240.  
Discusses the advances in microelectronics which increasingly allow control devices to be widely distributed and deeply embedded within systems. Control engineering therefore involves the integration of these controllers, acting in harmony across whole systems. Such systems, though, involve dynamic real-time processes, with inherent physical characteristics; controllers must therefore respond correctly, at the right time, safely and reliably. The paper introduces the tools available to produce software for integrated distributed systems, and highlights the uses and deficiencies of these tools.

**96/00774 Flow-induced vibrations in heat exchanger tube bundles**

Gelbe, H. *et al.*, *Chemical Engng. & Processing*, Jun. 1995, 34, (3), 289-298.

A review is given of the most important parameters which have to be evaluated for designing real heat exchangers to withstand flow-induced vibrations. After a short description of the mechanism of excitation, stability diagrams for fluid elastic instability are discussed. The influence of non-uniform velocities in multispacer exchangers and a sectional calculation of stability relations is explained by an example using a fluid-dynamic computer program. Some recommendations for structural data and design details are offered in conclusion.

**96/00775 Method for utilizing oxygen in rotary kilns for purification of ferroalloys**

Suwa, T. *et al.*, (Assigned to) *Nippon Oxygen Co.Ltd; Hyuga Smelting, JAP. Pat. JP.07,145,443*, Jun. 1995.

**96/00776 Natural gas fired combined cycle power plant with CO<sub>2</sub> capture**

Shao, Y. *et al.*, *Energy Convers. Mgmt.*, Dec. 1995, 36, (12), 1115-1128.  
A natural gas (NG) fired power plant is designed with virtually zero emissions of pollutants, including CO<sub>2</sub>. The plant operates in a gas turbine-steam turbine combined cycle mode. NG is fired in highly enriched oxygen (99.7%) and recycled CO<sub>2</sub> from the flue gas. Liquid oxygen (LOX) is supplied by an on-site separation unit (ASU). By cross-integrating the ASU with the CO<sub>2</sub> capture unit, the energy consumption for CO<sub>2</sub> capture is significantly reduced. The exergy of LOX is used to liquefy CO<sub>2</sub> from the flue gas, thereby saving compression energy and also delivering product CO<sub>2</sub> in a saleable form. By applying a new technique, the gas turbine efficiency is increased by about 2.0%.

**96/00777 Noise from cooling towers and air coolers**

Palenzuela, D. *Promoclim*, Jul.-Aug. 1995, (4), 6-14. (In French)  
Three articles dealing with noise from cooling towers and air coolers. Describes the calculation of noise levels at a distance, and give examples.

**96/00778 Optimization of automotive paint shop operation**

Milojevic, D. and Mainieri, W. *ABB Review*, 1995, (9), 21-28.  
Describes an automotive paint shop operation designed by ABB Flexible Automation GmbH, Germany.

**96/00779 The prediction of industrial fan sound power levels**

Cory, W. T. *Bldg. Acoustics*, 1994, 1, (3), 163-194.  
Discusses the aerodynamic, mechanical and electromagnetic sources of noise in fans.

**96/00780 READPERT - Development, selection and design of chemical reactors**

Schembecker, G. *et al.*, *Chemical Engng. & Processing*, Jun. 1995, 34, (3), 317-322.  
A new type of computer-based consulting system for the choice of chemical reactors during the first step of process design is presented.

**96/00781 Realistic robot simulation**

Bernhardt, R. *et al.*, *Computing & Control Engineering J.*, Aug. 1995, 6, (4), 174-176.

The authors discuss the simulation of industrial robots which has become an important means for the increased efficient application of robots. However, the simulations still do not reflect a desired reality. A breakthrough has been achieved by defining the realistic robot simulation interface. It enables the integration of original controller software into simulation systems.

**96/00782 Retention of volatiles in contact drying combined with membrane separation**

Knebel, T. and Schlunder, E. U. *Chemical Engng. & Processing*, Jun. 1995, 34, (3), 219-227.

The combination of contact drying and membrane separation has been examined in an experimental study. The drying material consisted of porous particles wetted with a binary mixture. It is shown that selective removal of the less volatile component is possible by properly choosing the applied membrane. Important influences of the operation parameters on the drying rate and selectivity of the drying process are presented and explained. The advantages of the combined process compared to a conventional contact drying process are discussed.

**96/00783 Simplified solution for temperature distributions of spherical and cylindrical products during rapid air cooling**

Dincer, I. *Energy Convers. Mgmt.*, Dec. 1995, 36, (12), 1175-1184.

The transient heat transfer between individual spherical and cylindrical products and the air medium during cooling was analyzed and modeled, and therefore, the centre temperature distributions of the spherical and cylindrical products were computed in a simple manner. These computed temperature distributions were compared with experimental measurements, and very good agreement was found between the computed and measured temperature values.

**96/00784 Specific energy consumption in the steel industry**

Bhaktavatsalam, A. K. and Choudhury, R. *Energy*, Dec. 1995, 20, (12), 1247-1250.

The specific energy consumption in the Indian steel industry is high compared to that in advanced countries. Data for four integrated steel plants in India have been analysed. The coals used are of much inferior quality. Experiments were conducted for selective removal of silica in coal. Theoretical analysis was performed of the effect of demineralisation on the specific energy consumption in an integrated steel plant.

**96/00785 Strontium**

Ober, J. A. *Min. Eng. (Littleton, Colo.)*, 1995, 47, (6), p. 558.  
A review of the production and uses of strontium compounds.

**96/00786 Transient modelling of a packed tower: Mass and heat transfer with reaction**

Hastaoglu, M. A. *Fuel*, Nov. 1995, 74, (11), 1624-1631.

A packed tower is modelled transiently for fluid-solid reactions. Heat and mass transfer are considered, with allowance for structural changes. The Knudsen, molecular and bulk flow terms are accounted for in the packed tower and within the pellets of the packing. Homogeneous, heterogeneous and catalytic reactions are handled. Conduction, convection and radiation model of heat transfer are considered. The thermophysical, structural and transport properties are included as variables. Three levels of space are used in the system: packed tower, macroporous pellets, and microporous zone (grain). The solution in these spaces includes the distributions of concentrations, temperature, pressure and solids conversion as well as all other parameters at any given time. The three zones are linked together via boundary values.

**96/00787 Upgradation of alumina refinery at Hindalco, Renukoot (India)**

Shah, R. P. and Gararia, S. N. *Light Met. (Warrendale, PA)*, 1995, 25-29.  
Hindalco's Alumina Refinery was installed in 1962 with a capacity of 40,000 ton/year alumina production with conventional high pressure digestion using mono-hydrate bauxite from Lohardago, Bihar, which was expanded to produce 150,000 ton/year alumina by adding a digestion unit and balancing equipments in the year 1967. The plant capacity has been increased to 350,000 ton/year by intensification of process, optimization of operating parameters and the addition of balancing equipments. Discusses the future plans to increase the plant capacity to 450,000 ton/year.

**96/00788 Wet/dry cooling tower eliminates plume at Teesside**

MPS, *Modern Power Systems*, Oct. 1995, 15, (10), 57, 59-60.  
Reports that the environmental reaction to the plumes from a cooling tower for the first gigawatt scale combined cycle CHP plant in the United Kingdom gave rise to an extraordinary engineering feat of retrofitting new hybrid parallel-path wet/dry cooling towers to work in conjunction with the existing single hyperbolic fan assisted cooling tower on an already compact site.