Summaries

JERZY CIEŚLIK

Damage and Irreversible Strain Development Analysis in Quasistatic Uniaxial Compression Tests of Dolomite Samples • Górnictwo i Geoinżynieria (kwartalnik AGH) • z. 1, 2010

This paper presents results of uniaxial quasistatic compression tests of dolomite samples. The main topic addressed was the analysis of rock samples failure in macro scale and observation of some micro mechanical failure processes effects. The micro mechanical processes (fracture or rock and grain slips) was analyzed by irreversible strain observation and calculated as different energy dissipation during loading and unloading of rock samples. A relationship between these micro mechanical failure processes and axial and lateral irreversible strain was shown in various strain rate loading conditions. All the tests were performed for a range of pre failure stress strain characteristics only.

Key words: *failure processes, irreversible strain, quasistatic uniaxial compression*

MARIAN BRANNY, BERNARD NOWAK, BOGUSŁAW PTASZYŃSKI, ZBIGNIEW KUCZERA, RAFAŁ ŁUCZAK, PIOTR ŻYCZKOWSKI

An Influence of air Velocity Profile on the two-phase Flow Parameters in the Ventilating Shaft • Górnictwo i Geoinżynieria (kwartalnik AGH) • z. 1, 2010

Several inflows of water beyond shaft brickwork occur frequently on the length of the upcast shaft. The article describes the results of influence of air velocity profile on the parameters of two-phase flow in the upcast shaft for accepting constant discharge of water flows to the cross-section of shaft with water drops diameter: 0,5 mm, 1 mm, 2 mm, 3 mm.

Key words: *two-phase flow, velocity profile, ventilating shaft.*

MARIAN BRANNY, WIKTOR FILIPEK, MICHAŁ KARCH

Airflow Patterns Inside a Short Blind Heading • Górnictwo i Geoinżynieria (kwartalnik AGH) • z. 1, 2010

Ventilation of short blind heading caused by through road air velocity is considered. A series of numerical tests was performed to determine the effect of different through air velocities on airflow patterns. The velocities ranged between 0,65 m/s and 2,1 m/s. 3D velocity fields was calculated using a finite-volume CFD computer code FLUENT 6.1. Two turbulence models (standard k- and RNG k-) as well as two near-wall models (wall function and enhanced wall treating) were tested. Numerical results were compared with experimental data.

Key words: *ventilation of blind headings, 3D flow fields simulation, CFD methods*

BERNARD NOWAK, KRZYSZTOF FILEK

Temperature Change of Condenser Cooling Water of Mine Air Refrigerator in the Ventilating Evaporative Cooler • Górnictwo i Geoinżynieria (kwartalnik AGH) • z. 1, 2010

The work treats of ventilator evaporative cooler of water, which is intended for cooling of mine compressor air cooler condenser. From mass and enthalpy balances of medium flowing through the cooler (air, cooling water and

spraying water) the equations from mathematical model for steady state were introduced; the spread in space character of medium parameter changes in the cooler was not taken into account but its concentrated character and connected with that fact jumping changes were accepted.

In the work, the results of example calculations were made by using computer program, which is created on the basis of introduced mathematical equations of cooler description. 27 variants, which are differed from each other in parameter values of medium at the inlet of cooler, were studied. Results of calculations are compiled in a table.

Key words: *mine air conditioning, water cooling, evaporative cooler*

BERNARD NOWAK, KRZYSZTOF FILEK, MARIAN BRANNY

Values of Coefficients of Heat and Mass Exchange in Evaporated Type of Water Cooler • Górnictwo i Geoinżynieria (kwartalnik AGH) • z. 1, 2010

Results of experimental studies of the performance of fan evaporative type of water coolers are presented in this paper. Tests were conducted with two types of coolers – RK-450 and CWW-420. Parameters of cooled and spray water and of the air were measured. On the base of data collected during laboratory experiments, coefficients of heat and mass exchange were calculated for both tested coolers. Among this coefficient are: overall heat-transfer coefficient through membrane (k), convective heat-transfer coefficient (α) and coefficient of mass exchange (β) between spray water and the air. There were determined regression lines and coefficients of linear correlation for k and á in dependence of inlet water temperature.

The results of experiments and calculations are presented in the form of plots and tables.

Key words: *mine air conditioning, water cooling, evaporative cooler*

JUSTYNA SWOLKIEŃ

Usage of „Dyspozytor" Application in the Process of Water Flow Regulation in the "Olza's" Interceptor Sewer • Górnictwo i Geoinżynieria (kwartalnik AGH) • z. 1, 2010

The article treats about the usage of "Dyspozytor" application in mine waters' flow regulation inside the "Olza's" interceptor sewer. Lack of its regulation is a main reason for huge variations of chlorides and sulphates concentration in the Odra river what in the end drives its ecosystem to the total destruction. Computer calculations show that in order to remain stable chlorides and sulphates concentration it is necessary for each interceptor sewer's object to work with a proper working parameters'. The computer program, together with "Olza's" interceptor sewer, helps to regulate water flow from each mine. It determines what kind of water class is possible to obtain taking into consideration river flow and its earlier contamination. Thanks to it is possible to maintain constant chlorides and sulphates concentration due to the exact water class. It is also possible to maintain low pressure in the interceptor sewer's pipelines what improves its energy consumption.

Key words: *computer program "Dyspozytor", chlorides and sulphates concentration, river flow regulation, "Olza" interceptor-sewer, mine waters, water classes, pumping pressure*

TADEUSZ SZPONDER, JUSTYNA SWOLKIEŃ, MARIUSZ KAPUSTA

The Analysis of Current Preventive Measures for Dust Hazard • Górnictwo i Geoinżynieria (kwartalnik AGH) • z. 1, 2010

The general characteristic of dust hazard in mining is shown in the paper. Specification of basic methods and measures to prevent this hazard is presented as well. The best method of fighting against the dustiness is to reduce the level of dust emission at the source. This report describes the most effective method in dust precipitation in air with help of optimum liquid atomizing by spraying plants.

Key words: *The source of dust emission, water mixture spraying, stream microstructure, droplet surface, the most effective dust precipitation method.*