

KORRÓZIÓS FIGYELŐ

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1-2. szám

2009

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SYNOPSIS OF THE PAPERS IN THIS ISSUE***Interactions between transmission lines and underground steel pipes***

by Á. Jambrich

The aim of this paper is to review the occurred technical-physical interactions between direct grounded high voltage transmission lines and near or crossing well insulated underground pipes. The approach raises electric shock protection question. The contact voltage formed during inductive interaction is shown by calculated results summarized in table. Dependence of the propagation coefficient, quality of insulating material, and the induced voltage upon geometry of arrangement is presented. Single realized situations are shown on pictures. Finally, solution methods, devices are given.

Corrosion aspects when using heterogeneous welded joints

by A. Bacskai

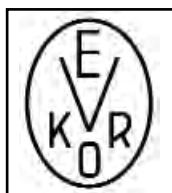
Heterogeneous welded joints are complex structure parts from the point of view of corrosion risk. There are welding engineering advantages, but corrosion disadvantages can also be arisen. As looking to the various corrosion damages, it can be stated, that the heterogeneous weld is much rather a vulnerable

point on the structure than the homogenous. Damages which cause cracking mean particular danger (stress corrosion, corrosion fatigue, hydrogen-induced cracking). The heterogeneous welded joints of pipelines cause many trouble, because these constitutional changed back welds can be tested with difficulty.

Boiler water corrosion case study

by M. Horvátth and V. Zanathy

The physical features of water are well favorable in liquid or vapor state. Therefore water can be used for heat transfer, cooling and fire extinction. There are interaction between the structural materials and the compounds of water. During this, materials suffer corrosion. This is a well known phenomenon, designers calculate with expected lifetime during his work. Notwithstanding, many cases occur when hot water supply systems have been damaged after short time of operating. The corrosion effect of water or steam is not so aggressive than the effect of acids. But the practical significance is great, because these equipments can be fixed and changed with difficulty. We would expect long life and undisturbed operating. The corrosion of equipments in steam shop is significant because of breakdown of service and explosion risk.



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SYNOPSIS OF THE PAPERS IN THIS ISSUE***About the microbiological degradations of polyethylene in the urban networks***

by J. Lingvaj, C. Groza, C. Lingvaj and I. Csuzi

Different PE sorts and different PE quality are used for anticorrosive insulation for metallic pipes or for manufacturing of PE pipes and power cables. The paper presents the experimental results regarding the biodegradability of PE from the urban networks.

Practice of cathodic protection, measurement errors and its solution possibilities

by B. Borbély

The article presents the circuits of outer power source cathodic protection. Measuring faults are discussed in connection with single project and multi project circuits. The author's aim is to find a solution for eliminating measuring faults of compensating

current. One theoretical solution can be the application of in-built diodes.

Surface protection works of Tiszalök gate dam

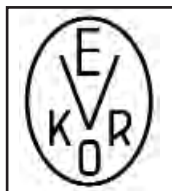
by L. Gálfi and L. Fortuna

Tiszalök river barrage is a very important hydroelectric power station on the river Tisza. In the year 2008, dam panel no. 2 was renovated. This short presentation introduces the technology of used coating system and the difficulties of its application.

60 years history of Corrosion Department of Scientific Society of Mechanical Engineering

by K. Nemes

The history of Scientific Society of Mechanical Engineering and its commissions is presented in this review from the foundation till now days.



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SYNOPSIS OF THE PAPERS IN THIS ISSUE***Examination of flue gas fan breaking***

by A. Bacskai and Gy. Kálmán

Short lifetime of flue gas extract fan of calcium carbonate drying stove was caused by catastrophic breaking originated from intercrystalline stress corrosion. Stress corrosion cracking can be caused by application of unalloyed steel plate, stress state originated from welding stress and operation load, ammonium nitrate and humidity content of flue gas and fast erosion damage of protecting coating from the inner surfaces. For obtaining appropriate long and safe lifetime, it is practical to make the flue gas fan of austenitic stainless steel.

Application of vinyl ester resins for chemical resistant coating of tanks storing aggressive media

by J. Molnár and D. Bencsik

With appropriate selection of vinyl ester resin, materials which can cause damage can be effectively closed from the structure. The aim is to form corrosion protection coating which can make up continuous closed surface, and can protect the structures or tanks or pipes not only from chemicals, but from sur-

rounded electrical effects. For this, chemical resistant vinyl ester resin need to be chosen property, and the adequate cross-linking and processing conditions have to be provided. Only waterless and hydrogen peroxide free initiator can be used. Only Chemical resistant glass can be used as reinforcement. It is practical to apply glass flake content topcoat to the surface. Double-walling of tanks can be easily done with application of a special 3D textile glass.

History of corrosion expert engineer education in BME

by P. Hencsei

In our country, in the decades past, the most successful form of corrosion expert education was the postgraduate education in the universities. The education had started at the same time, in 1964 in Budapest and in Veszprém, and had lasted until 1980 in Chemical University of Veszprém, and until 2005 in BME Department of Chemical Engineering. In this two place, almost 400 people had been got acquainted with the basis of corrosion, various methods and materials of corrosion protection. In this review, the history of corrosion expert engineer education in BME between 1964 and 2005 is summarized.



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SYNOPSIS OF THE PAPERS IN THIS ISSUE***Chemical decontamination of steam generators used in nuclear power plants II. Comprehensive investigation of the efficiency of chemical decontamination technologies***

by K. Radó, E. Deák-Horváth, K. Varga,
Z. Németh, I. Varga, G. Szeiler, A. Szabó-Nagy,
P. Halmos, J. Borszéki, J. Schunk,
G. Patek and P. Baradlai

Our earlier publications have been focused on detailed explanation of the effects of the applied AP-CITROX chemical decontamination technology on the corrosion state and surface morphology of heat exchanger tubes of steam generators (SG). These studies have revealed that the industrial application of the decontamination technology results in the inhomogeneous dissolution of stainless steel surface, leading to the formation of oxide layer with undesired chemical composition and structure which exhibits potentially greater mobility in the primary coolant. Laboratory examinations have provided an independent verification of the formation of the so called "hybrid" structure.

The first part of our three-part series has presented some selected findings on the corrosion and surface chemical effects of the AP-CITROX technology as well as the fundamental issues of the technology development. Present paper deals with the efficiency (mass transport and decontamination characteristics) of the novel chemical decontamination technologies elaborated for the treatment of the inner surface of SGs and regenerative heat exchangers of the water purification system No. 1.

The third part of our series is scheduled to highlight some results obtained by laboratorial analysis of the effects of the two novel technologies on the corrosion state as well as on the structure and composition of surface oxide layer. Determining the radioactivity of specified nuclides in the solutions used for decontamination, important conclusions on the efficiency of the main technological steps as well as on the distribution of radionuclides in the depth of treated surface can be drawn.

Applied grounding solutions of cathodic protected underground steel pipe approaching transmission lines

by Á. Jambrich

The first part of this article reviewed the occurred technical-physical interactions between direct grounded high voltage transmission lines and near or crossing well insulated underground pipes. It was stated, that grounding of the pipe is the solution. In this article effect of the grounding on the insulated cathodic protected pipe is examined with a model. Its result is plotted in a graph. In the end, grounding methods and devices are shown.

TECHNIGALVA[®], an advanced hot dip galvanizing process in NAGÉV Ltd.

by Á. Antal

In this article, a hot dip galvanizing process is presented, with which hot dip galvanization of Sandelin steels can happen in good quality. The effect of Ni added to zinc melt as component is to significantly decrease the iron-zinc bidirectional diffusion intensity during coating formation. By this means, thinner zinc coating is formed. The zinc layer will be optimal because the metal diffusion rate is slower. The uppermost phase is pure zinc layer, so the coating is particularly glossy, silvery and cost-effective. Mechanical properties are better than the zinc layers formed in conventional melts.

Installation experiences of a hot dip galvanizing plant in Mexico

by G. Garas

How and why did a Hungarian hot dip galvanizing expert get in Mexico, and how difficult was to install an otherwise every point of view very modern plant. The author talks about these, cultural differences and professional difficulties.



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Baja Bernadett – Horváthné Deák Emese – Berkesi Kata – Varga Kálmán és szerzőtársai:
Atomerőművi gőzfejlesztők kémiai mentesítése III. Dekontaminációs
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SYNOPSIS OF THE PAPERS IN THIS ISSUE

Chemical decontamination of steam generators used in nuclear power plants III. Comparative study of the corrosion and surface analytical effects of the decontamination technologies

by B. Baja, E. Deák-Horváth, K. Berkesi, K. Varga, K. Radó, Z. Németh, G. Szeiler, A. Szabó-Nagy, D. Oravetz, J. Schunk, G. Patek and P. Baradlai

Our earlier publications have revealed that version of the AP-CITROX technology applied for chemical decontamination of the steam generators (SGs) of the Paks NPP was not adequately developed considering its chemical, analytic and corrosion aspects. To replace the AP-CITROX procedure, novel „soft” chemical decontamination technologies have been elaborated at the Institute of Radiochemistry and Radioecology of the University of Pannonia.

Present paper deals with the comparative study of the corrosion and surface chemical effects of the novel chemical decontamination technologies. The chemical composition and morphology of the oxide layer formed on the inner side of the austenitic stainless steel specimens before and after the full decontamination process were studied by scanning electron microscopy (SEM), equipped with an energy dispersive X-ray microanalyzer (EDX). The passivity of the inner surfaces of the stainless steel samples was studied by voltammetry. The full decontamination cycle has been performed under laboratory conditions in a pilot plant circulation system elaborated earlier. In various steps of the chemical procedure the concentration of the main alloying components (Fe, Cr, Ni) dissolved from the surface oxide layer into the decontamination solutions was determined by ICP optical emission spectrometric (ICP-OES) method. Based upon the ICP-OES results the average thickness of the oxide layer removed from the surface into the solutions was calculated. The activity concentrations of the radionuclides (^{60}Co , ^{58}Co , ^{110}Ag , ^{54}Mn) measured in the decontamination solutions allow us to draw conclusions concerning the efficiency of the main steps of the technology and depth distribution of the radionuclides on the treated steel surfaces.

CPM 401 cathodic protection diagnostic technology

by Z. Lukács jr. and Z. Talpai

The aim of the present work was the development of a high performance cathodic protection diagnostic technology which exploits the advantages of a more complex theoretical treatment of current-potential relationships and the remote potential and a unique measurement technology which provides very reliable potential data in fast routine measurements (e.g. CIPS and DCVG measurements) even in high resistance environments. The novel aspects of theory and the unique features of measurement technology are discussed. The versatility of the method is demonstrated on field measurement data.

Corrosion examinations of refrigerators

by M. Horváth

There can be contact corrosion at the connection of aluminium, steel and copper parts of refrigerators. It is practical to do laboratory tests for evaluation of corrosion risk. Water can be condensed on the surface of cold tubes, therefore painting of connections can be a solution. In case of copper tubes, stress corrosion also can be risky. All conditions of stress corrosion are not existed at one of the two examined case. At the other case, riskiness of washing and circulating liquid had been proved true. It's an interesting experience that localized corrosion of aluminium pipe can be caused by chloride dissolved from insulating foam.

Technical novelties and developments in the area of coating and concrete structure testing in the field

by G. Mohácsi

In this short review the author presents some new developments in the area of on the spot coating and concrete test equipment. The presented devices are the following: layer thickness measuring gauge, dew-point meter, rebar detector and covermeter, and the renewed Schmidt hammer.