



PRODUCTION RESERVES

FORECAST OF THE RESOURCE OF THE VALVES WITH TWO-POSITIONED SOLENOID DRIVE

page 3–8

This article presents the analysis of the resource tests results of valves with a two-position electromagnetic drive, widely used in the devices of aviation and space technology. Degradation processes research has been conducted, which take place in the elements and units of the valves during the resource exhaustion under the influence of operational loads. The critical element of the valve movable part has been discovered. It is the rod that limits the resource of the device. The probabilistic model of damage accumulation in the design material of the rod leading to the destruction of the rod due to fatigue is provided. Prognostication methods of resource of the valves with two-position electromagnetic drive have been developed based on the probabilistic model of damage accumulation in the valve elements. The use of the developed method at the designing stage will make it possible to considerably decrease the number of the necessary resource tests of the valves for receiving probabilistic characteristics of their specified resource.

Keywords: valve, two-position electromagnetic drive, damageability, working material, rod, resource prognostication.

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COOLED METALLIC BARS WITH HEATCOVER COVERAGE

page 9–11

Currently, there is a significant demand for cast parts, requiring no further machining, especially true for complex cavities of high

quality. On the one hand, it is impossible to obtain the necessary quality with sandy clay rods without subsequent machining, on the other hand, the machining is difficult because it is impossible to bring the tool work surface.

In this article the complicated technology of obtaining cavities with metal rods cooled quality is considered. This approach allows you to adjust the intensity of the cooling rod, and, consequently, the casting, which gives us additional leverage to produce quality castings.

The article also discussed method of calculating the required time «cake frosting» in the manufacture of a metal rod, the optimum thickness of the thermal barrier coating and the cooling of the rod.

Such technology can be used in the manufacture of pistons cooled internal combustion engines, hydraulic equipment, etc.

Keywords: metal bars, rods cooled, thermal protection, coatings and paints.

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SAFETY AND TECHNOLOGICAL HYGIENE IN PRODUCTION OF ACTIVE PHARMACEUTICAL INGREDIENTS

page 11–14

Practical implementation of the principles of safety and technological hygiene is carried out with proper organization of production design and operation of equipment under specific operating conditions. To solve biosafety issues at the stage of production design the features of technological hygiene require consideration, where a subject of production is personnel and the environment.

Production of active pharmaceutical ingredients using the biotechnology and based on it pharmaceutical production have a significant impact on actions on safety and personnel hygiene, and actions to protect the environment.

To ensure the product quality, personnel safety and environmental protection two basic types of actions are required — correct design of the production and proper design and operation of equipment. A methodology and principles of project activities, design and operation of equipment of technologies of active pharmaceutical ingredients for the production of immunobiological drugs were developed.

An essential element of the design, production and operation of the equipment is compliance with Good Manufacturing Practices (GMP) when using clean premises.

Keywords: hygiene, active pharmaceutical ingredient, immunobiological drugs, biological agent.

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DEPOSITION $TiCl_{2(3)}$ IN MOLTEN $KCl : NaCl : MgCl_2$ ACCORDING TO THE HUMIDITY LOADED $NaCl$

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HIGHLY EFFECTIVE TECHNOLOGICAL COMPLEXES FOR DEHYDRATION AND FILTRATION OF A DISPERSE FOOD WASTE

page 14–19

The schemes of highly effective processes and the equipment for dehydration and filtration of a damp disperse food waste (coffee and barley slime, beet press, spirit bards, beer pellet) are presented in this article. The method of division of all technological process of waste processing into consecutive stages, each of which is realized on a separate unit of equipment, with increase from stage to stage of loading intensity of a waste having been used. As a result the schemes of vibro-blowing sieve with a hydraulic pulse drive (HPD) for the first preliminary dehydration of waste concentrate, screw press and vibro-press with HPD for the second and third dehydration, rolling installations with HPD for final dehydration are elaborated. The waste filtrate passes through the stages of micro-, ultra- and nano-filtration on installations with HPD, which are carried out under the uniform scheme and differ in filtering elements and by operating mode. Realization of offered schemes on manufacturing will allow in comparison with the known technologies and the equipment for dehydration and clearing to provide the best parameters of efficiency (high productivity, low power consumption, the set final humidity of waste concentrate and sufficient degree of clearing of its filtrate). Dependences for definition of specified efficiency parameters while realization of processes vibro-blowing dehydration and filtering of a waste are also presented.

Keywords: vibro-blowing dehydration, a damp disperse food waste, hydraulic pulse drive.

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The presence of titanium in the reverse chloride magnesium of titanium production, entering in an electrolysis workshop producing raw magnesium, leads to the reduction of output of magnesium by current and to the malfunction of magnesium electrolyzers. The available literature data indicate that, as a rule, the reduction of the current efficiency has seasonal nature: the consistently high values of current efficiency are observed in the period of the year with high humidity, and vice versa – in dry periods the reduction in current efficiency is observed. The technological challenge is to ensure the contact of the electrolyte of magnesium electrolyzers with moisture in dry months of the year. The aim of this study was to evaluate the effect of moisture on the removal of titanium from the melt into an insoluble deposition, which would help to develop technological solutions to improve the performance of electrolysis.

In this respect, we have carried out the full factor experiment 2^3 . This technique allows assessing of the significance of the influence of each of the selected factors on the optimization parameter – the number of deposited titanium from the melt.

The obtained regression equation indicates that the substantial influence on the electrolyte purification from impurities of titanium has moisture, in this case moisture of the table salt. The analysis of samples of all the experiments on the content of magnesium oxide showed that it does not exceed 0,05 % of the masses.

The practical recommendation that can be drawn from the experimental data is that it is necessary to load the damp salt in the dry season to the head unit of the production line or into a working electrolyzer during the filling of the next portion of magnesium chloride.

Keywords: electrolysis of magnesium, production line, lower titanium chlorides, factor experiment, humidity.

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AUTOMATED REGRESSION TESTING OF COMPUTATIONAL ALGORITHMS BASED ON NEURAL NETWORKS

page 23–29

Software testing phase in our days became a very important part of software development process.

Automation testing plays a key role in agile projects. To reduce the time and effort spent for testing, different extended approaches are used. In our days the artificial intelligence is used for providing different algorithms in different spheres of IT. This article is about the combining the usage of testing artifacts and testing approaches with neural networks working in pair to classify the testing oracle results. Our algorithm is based on QA test case testing concepts, which is laid to neural network usage approach. Test cases are used for verifying whether a tested functionality satisfy the requirements. We created a set of rules how to execute and optimize needed data from test cases to teach the separate neural networks for simulating the tested functionality behavior. According to this, the tested application is somehow substituted by the learning network, which is used for examining the future functionality releases, influenced by hidden errors during regression. The difference of network and application results is combined by the specially created comparison tool calculations that are the basis of created testing oracle. Also we described the approach for creating optimized neural network structure for learning algorithm, that is back propagation in our case.

Keywords: testing oracle, automation testing, neural networks, back propagation algorithm, test-case.

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SINGLE THEORY OF MOVERS ON THE CONTINUOUS FLOWS. SHORT THEORY OF COUNTERTURN ROWING SCREWS

page 30–38

The article presents the developed brief theory of counterturn screws, which is a logical chain of a series of articles relating to the formation of the theory of short-row screws, the brief theory of counterturn screws, the brief theory of co-turn screws, the comparative analysis of single row, counterturn and co-turn screws, in order to select the most effective option. It was shown that counterturn screws have large energy costs and very low traction efficiency, 35 % and 5–7 % respectively in the first and the second impeller. Based on the above, the ultimate goal of a series of articles will be: to show and to prove that among single-row, counterturn and co-turn screws the most effective are co-turn screws. They permit to eliminate the main drawback of single and counterturn screws, related to the presence of kinematic zone of elastic impact, Figure 1, section B1-B1, generating into the space powerful shock waves in an oscillatory mode. The next drawback of counterturn screws is the twist of the stream of the first impeller, which regulates the counter twist of flow at the input to the second counterturn impeller, which, in turn, regulates the increased hydrodynamic loads on the troughs of the blades of the second counterturn impeller and its low speed compared to the first. Therefore, the next article will cover the creation of a brief theory of co-turn screws, which will present their full analysis.

Keywords: kinematic analysis, counterturn screws, thrust of the blown profile, lift force.

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ECONOMY OF ENTERPRISE

EVALUATION OF FIXED ASSETS MEDICAL INSTITUTIONS

page 39–42

The application of the method of peer review to assess the quality of core health care settings are discussed in this paper and some of the results of our research in this area are given. The main objective of the study is to develop methods of evaluation of quality of assets of health care settings. The article discussed the sequence of evaluation, survey features and other important details. The given method allows to obtain important information using conventional assessment tools. The results obtained from the use of this technique will serve as a basis for management decisions concerning the development and use of capital health care setting. The suggested method of evaluation can effectively solve the problem of restructuring the core health care setting. This technique can be applied to any health care institutions, regardless of their specialization. The results can be applied by managers, economists and other professionals who work in health care settings.

Keywords: capital assets, quality, medical equipment, financial analysis, medical services.

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THE ANALYSIS OF THE ALTERNATIVE PROJECTS TO ESTIMAING THE AMOUNT AND MODEL OF THE VEHICLE

page 43–45

The author emphasizes the fact that in today's market conditions determining the number and brands of vehicles (ATS) should be considered not only with its technical and technological point of view, but also the costs of alternative projects should be analyzed.

In modern conditions, a variety of different types and models of rolling stock can be used for the carriage of the same types of goods most suitable according to certain parameters of vehicles. Such parameters, for example, can be performance, cost, and others.

The calculation of costs is a crucial factor in determining the number and model of the vehicle. It is necessary to take into account not only current costs but also the costs that will inevitably be incurred if the project is accepted. However, in addition to economic and accounting costs, it is necessary to consider the project from the point of view of the available alternatives, as spending the same amount of the means of production can be achieved through economic effect.

The most important from the point of view of the owner of the project and the investors are the indicators of the commercial viability of investment projects, which the conditions of the system can allocate the net present value (NPV). Analysis of the results of this indicator allows to choose the project of forming the vehicle fleet, the efficiency of which is the maximum for the lifetime of the project. Also, taking into consideration the opportunity of serving several customers with the same type of goods on a transport label, you can find alternatives to the project by compiling a matrix that displays the performance of such services, subject to certain restrictions.

Keywords: alternative project of the motor vehicle, the same type of goods, net present value, performance.

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THE EFFICIENCY OF PERSONNEL APPOINTING OF THE ENTERPRISE TO POSITIONS: MATHEMATICAL ASPECT

page 49–51

Theoretical basis and scientific – methodological statements are grounded on rational distribution and the use of resources, on the optimal distribution of working staff.

It is well-proved that the most close to staff placement is a «task personnel appointing» one: the best distribution of certain amount of work between the same number of performers on condition of mutual accordance between numerous tasks and its performers.

The content of the subject on efficient personnel appointing of the enterprise on positions is mainly determined by the content and the character of the labour of the personnel in the management system established here.

Attention is accentuated on the creation of high-performance and proof productive collectives, logically not to overload workers and to assign them to do the job with the most productivity of their fulfilment, but using mathematical calculations to forecast activity of an enterprise.

It is marked that the offered mechanism, unlike existing one is capable to provide efficiency of the enterprise development, its competitiveness due to the grounding of choice and providing the achievement of aims of the activity of enterprise, adaptation to the terms of external environment. It is oriented to the search and realization of the possibilities of the enterprise, which will provide steady development and survival of enterprises in a period of post transformation economy.

Keywords: management of the personnel, task appointing personnel, optimal distribution, matrix of expediency.

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RISKS OF OUTSOURCING AND THEIR EVALUATION

page 45–48

Despite the great number of literature on the risks of outsourcing, the problem of their quantitative analysis remains unsolved. Therefore, the purpose of the study is to identify the main features of evaluation of the risks of outsourcing when implementating them into production and business activities of enterprises. In particular, on the basis of analysis of statistical and expert techniques we have developed the expected rate of riskiness of outsourcing that characterizes the quantity of losses that a customer of outsourcing operations may incur. Using the ratio of incurred losses caused by the risks of outsourcing activity and the limiting level of risk, the company may decide whether it is appropriate to implement such tool of doing business.

When the expected level of a risk is higher than or equal to the limiting one, we proposed a matrix of decision-making regarding the management of the outsourcing risks by an enterprise-customer. Based on this matrix key factors of the risks can be evaluated and appropriate measures can be designed to reduce their negative impact. The results of the research can be used at the enterprises of any kind of economic activity, which are planning to transfer a part of their business processes to a third-party organization. The method of the outsourcing risks evaluation will facilitate their identification, analysis, monitoring and control as well as provide a reduction of losses caused by such risks.

Keywords: outsourcing risks, expected risk of outsourcing, limiting level of risk of outsourcing.

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