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Effect Of Diffusion Coatings On Corrosion Resistance And Performance Of Mechanical Parts

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Abstract: The upper limit of the temperature of the diffusion,The use of precious metals in these sectors is related to the operation of parts in the aggressive and since the separation of concerns due to several connection options is of great importance, it allows precise solutions to specific problems, data analysis and more accurate decision-making. Difficulties. Digital platforms provide concrete solutions to specific problems.

Keywords: Diffusion chromizing, alloys, corrosion, technology, material, mechanical engineering, chemical-thermal treatment, cracks, raw materials, cooling.

Introduction: The main consumers of corrosion-resistant high-alloy steel and alloys are the automotive, petrochemical and aviation industries, as well as thermal and nuclear power, shipbuilding. The use of precious metals in these sectors is related to the operation of parts in the aggressive environment of electrolyte solutions based on salts, acids and alkalis, gas mixtures and gas-vapor environment. Surface diffusion coatings are used to eliminate or slow down processes at the ambient metal interface that adversely affect material performance. In this case, the base metal provides strength criteria, and the coating protects against environmental influences, temperature, etc. After all, structural materials receive corrosion resistance, heat resistance, resistance, cavitation resistance, etc. Despite the possible universality of

Currently, there are many methods of applying coatings, and among these methods, the method of applying a coating in an environment with a low melting point is distinguished by its versatility, technological simplicity and economic efficiency. In addition, this method has another important advantage - the ability to combine the process of applying coatings with the process of joining parts into a permanent structure.

The number of works devoted to the study of isothermal transition in solutions of low-melting metals is not so great.

A summary of the literature on this issue V.I. presented in the monograph. Nikitina. In these works, low-melting metals were considered as heat carriers for power plants, and the research was conducted at low temperatures of about 773-873 K - unacceptable for obtaining high-quality diffusion coatings. But these data make it possible to determine the presence of mass transfer in various contact pairs through the liquid phase of a low-melting metal, where the diffusion rate increases by 3-6 times. The results show that if, according to the phase diagrams of two metal systems, solid solutions or compounds can be formed, then this pair undergoes an isothermal transition when placed in a solution of low-melting metals.the application of diffusion coatings, the methods of obtaining them scientifically and technically have not been sufficiently developed.It is possible to change the flow of the diffusant supplied to the surface to be coated and its diffusion into the volume of the main metal. The influence of temperature on diffusion processes is described by Fick's law, and the intensity of the process always increases with the increase in temperature. In the temperature range of 1373–1573 K, the values of diffusion coefficients in the solid phase

increase by an order of magnitude.

The upper limit of the temperature of the diffusion coating at high temperature is determined by the structural changes in the product material and the technical capabilities of the technology and equipment used. The significant influence of the transport solution is noted in Chapter 1.2. and the choice of its composition is one of the effective ways to activate the diffusion coating process at high temperature. It is not practical to increase the process time due to the lack of technological feasibility of long-term operations in serial production. Also, long-term diffusion processes at the border of the diffusion zone of the coating - the base metal of the product can significantly change the proportions of the main alloy components. In addition to the above-mentioned main parameters of the high-temperature diffusion coating process technology, several additional parameters can be noted that can significantly affect the intensity of the process.

Difficulties. Digital platforms provide concrete solutions to specific problems. But, in general, the following problems are solved.If blockchains are not open, there can be vendor lock-in, meaning that service providers offer proprietary platform services with unique governance and business models. They are open to anyone who wants to agree to it. Thus, without consulting service from the vendor, it is not easy to expand the platform to provide new services. Interoperability and standardization are needed to easily add building blocks to other services.

Many platforms focus on integrating services from specific domains.

The Services are designed for the platform and work only on that platform. Current platforms have data security and privacy issues. Each platform has its own way of dealing with this, and the average technology is not flexible enough to effectively address the data privacy and owner aspects and the ability to track where that data is being used.The use of temperature changes of coatings during chemical processing allows to reduce the temperature of the saturation process, for example, during nitrocarburization, which reduces bending of parts and reduces energy consumption.The most promising types of temperature change of the coating for alloys with rare high-temperature diffusion coatings can be considered high-temperature QHO' (HTCO), which is carried out in the temperature range of the maximum diffusion mobility of atoms.TCO is used in direct chemical-thermal treatment (CHT) processes ¬and allows to achieve the enrichment of surface layers with the necessary diffusion with metals or non-metals from the external active medium in a shorter time than isothermal holding

RESULTS AND DISCUSSION

An effective way to control the formation of the coating is non-isothermal saturation regimes. In this case, tools with an optimal composition are used to clean the surface layers of the coated metal from impurities and oxide films. It was found that structural factors such as detail cleaning and the unevenness of the structural state of the saturated metal play an important role in enhancing diffusion processes.

In the process of chemical saturation of the surface of steel products, the intensity of diffusion currents depends on the temperature regime, temperature gradient, heat transfer of the components, internal structural stresses that occur during changes, and thermal stresses that occur as a result of the temperature difference during the cutting and cooling of the part.

Also, in mobility and multimodal transport, the amount of data is growing rapidly and the complexity of managing vehicles, transport chains or transport networks is expected. As a result, it will not be possible to select optimal options using manual planning or simple data analysis methods. Thus, AI solutions can support or even supervise humans to work with large amounts of data and manage complexity in (real-time) situations.

As explained in TNO and TKI Dinalog (2020), AI applications can focus on: people and objects, including road users, vehicles, goods, sorting belts and infrastructure; processes and systems, including supply chains, transport hubs, transport, policies and regulations.

Smart applications in mobility and logistics such as self-driving vehicles (cars, trucks, trains, barges), smart electric charging, predictive maintenance, self-learning energy and waste management, cooperative mobility, shared economy and self-organization. logistics.

The main objective is to explore possible reasons for this slow adoption and to assess how recent technological advances have changed the landscape, thereby helping to overcome these barriers. Thus, the contribution of this review is twofold: it advances existing knowledge by providing an up-to-date overview of existing and emerging ICT applications in multimodal transportation and existing electronic multimodal transportation barriers.

For example, a driver arriving at the terminal can use the built-in application to scan his mobile phone to notify the operator of his arrival, and then provide immediate feedback on where to drop off the goods on the mobile device. If the mobile device has GPS enabled, it can automatically notify the driver of the

next task. The app can be expanded for faster customs clearance, real-time tracking of goods and dangerous goods guidance. Technologies can overcome a number of barriers to ICT adoption, including company size, integration visibility issues, and financial constraints. Container tracking is another area of the Internet of Things.

Container tracking typically relies on RFID tags attached to shipping containers, boxes and pallets, which are then read at various points along the way. A limitation of using RFID only for container tracking is that the data can only be captured if the appropriate infrastructure such as RFID readers is available.

Information processing systems are needed to organize the multimodal transport process. Information transport systems include the collection, storage and transmission of information. Due to the large flow of information and the presence of various parameters, there will be growth and development in this field only if the information and communication systems are at the level of demand.

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