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Monograph

SELECTED PROBLEMS OF SURFACE ENGINEERING AND TRIBOLOGY

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CONTENS

INTRODUCTION

The monograph presents a wide range of issues related to the exploitation of technical facilities, such as plain bearings, mechanical seals, machine parts subject to tribological wear and of increased corrosion resistance. A unified approach to solving operational issues involving the use of interdisciplinary knowledge included in tribology and surface engineering has been taken to tackle the problems raised in the monograph. The issues of shaping and properties of surface layers obtained by electrodischarge machining (EDM) are especially widely treated in the monograph.

Chapter 1 presents the problem of manufacturing surface textures and their role in reducing friction resistance. Chapter 2 is a synthesis of technological capabilities, the quality of surface layers and the cost of producing plain bearings in view of achieving the minimum cost of production. Chapter 3 gives an interesting overview of contemporary research results in the field of fretting corrosion. It has been shown that the most prospective method of its prevention is EDM surface alloying of copper and zinc. Chapter 4 is devoted to the description of the present authors' original and patented method of increasing the durability of pans of plain bearings made of babbitts and copper alloys by electroerosion alloying. Chapter 5 concentrates on an increase in the durability of plain bearings commonly used in the construction of machines by producing layers of transition between the steel substrate of a pan and the surface layer of a babbitt.

Chapter 6 presents the technology of producing wear-resistant regenerative coatings using the method of electric spark alloying with the simultaneous use of the polymer material of properties tailored to the material type of parts and to working conditions. Chapter 7 provides a systematic approach to the selection of technology for producing elements of mechanical seals. The authors focused on modern technologies of producing surface layers with a view to improving the quality and life of seals.

The issues raised in the monograph are the subject of long-term bilateral cooperation between the Kielce University of Technology and the National University of Agriculture in Sumy, Ukraine. The results of this cooperation were, among other things, presented at the jointly organized conferences HERVICON and TEROTECHNOLOGY.