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Investigation of Tribotechnical Properties of Technological Water-Soluble Topocomposite

Abstract: In the modern mechanical engineering serial and mass production, the technologies for producing the axisymmetric parts from the sheet steels by cold drawing and deep drawing are getting widely spread. When using the technological coatings and lubricants with low lubricating properties, the hard surface of a die splines or scratches the softer metal of a deformable workpiece, the fatigue processes develop on the surfaces of a die tool.

To eliminate these disadvantages, copper, zinc coatings made of molten salts, polymers as well as the technological lubricants are applied to the deformable workpiece. The disadvantages of these technologies are the difficulty to apply the coatings to the workpieces and remove them, explosion and fire hazards, harmful effects on workers, the difficulty of waste disposal and negative impact on the environment. For drawing the axisymmetric parts made of corrosion-resistant steels, a water-soluble environmentally safe topocomposite TK-2 consisting of sub-lubricating and lubricating coatings has been proposed. A procedure for testing the technological coatings on the end surface of the friction machine "on a fresh track" have been developed. The comparative tribological tests of the IIB-4 sub-lubricating coating of TK-2 topocomposite and the coating based on Zapon lacquer HII-62 used in industrial conditions have been carried out. The advantages of the antifriction properties of the IIB -4 sub-lubricating coating have been shown.