44 Polish Tribology Conference – Autumn Tribology School
8 - 11 September 2026, Gdańsk

EFFECT OF TEMPERATURE AND OVERHEATING CONDITIONS ON THE TRIBOLOGICAL PROPERTIES OF STELLITE 6 ALLOY

Patrycja Korzeniowska[1], Dominika Grygier [1]*, Mariusz Opałka [2]

[1]Department of Vehicle Engineering, Faculty of Mechanical Engineering, Wrocław University of Science and Technology, Smoluchowskiego 25, 50-370 Wrocław, Poland

[2]Department of Fundamentals of Machine Design and Mechatronic Systems, Wrocław University of Science and Technology, Łukasiewicza 5, 50-371 Wrocław, Poland

**corresponding Author e-mail: dominika.grygier@pwr.wroc.pl*

Keywords: Stellite 6, high-temperature degradation, SEM

Abstract: The cobalt-based alloy Stellite 6 is characterized by high resistance to wear, corrosion, and elevated temperatures, which makes it suitable for components operating under severe working conditions. The aim of the study was to evaluate the influence of temperature on the microstructure and abrasive wear resistance of this alloy. In order to reproduce real operating conditions of components used in high-temperature environments, the samples were exposed to different temperatures for a specified period of time. The research scope included microstructural analysis using light microscopy and scanning electron microscopy (SEM), Vickers hardness measurements, and abrasive wear resistance tests to assess the effect of thermal exposure on the functional properties of the material. Tribological tests were carried out using a Tester T-07 device in the presence of loose abrasive particles, which enabled the determination of the effect of temperature on the intensity of material wear. The analysis of the obtained results will allow verification of the safe operating temperature range and determination of the influence of overheating and failure conditions on the degradation of the structure and эксплуатационные properties of the investigated alloy.