Hydrodynamic bearings are widely used in various branches of industry, such as automotive or energy. During the operation of such a bearing, a layer of lubricant separates moving elements and transfers loads under conditions of hydrodynamic lubrication. This separation between the elements of a joint with a hydrodynamic bearing allows to virtually eliminate the process of wear (when continuous hydrodynamic lubrication is maintained) which allows for its very long livespan.

In most practical applications, the maintenance of exclusively hydrodynamic lubrication in a bearing is impossible. Oftentimes, it is forced to operate under conditions of mixed lubrication (when the amount of lubricant is insufficient to maintain a separation between surface irregularities of a friction pair) or even dry friction. Such situations include start-ups, emergency stops, or bearing overload.

In cases of mixed lubrication or dry friction, some degree of contact between the elements of a friction pair is present. This leads to wear, whose speed of progress is dependent on the parameters of the involved bearing system.

Polymers, which are usually characterized by their low coefficient of dry friction, are frequently a material of choice for bearing applications involving mixed lubrication.

PEEK (Poly-Ethero-Ethero-Ketone) is a modern polymer material demonstrating excellent tribological properties, which leads to its increasingly often use in bearings. Until now, the phenomenon of its wear in a journal-bearing contact has not been sufficiently explored and requires further experimental research,

The aim of the research project is a thorough investigation of PEEK polymer bushing wear in a friction pair with a steel journal. The objective will be achieved through a range of tests performed on a radial bearing test stand under static load, followed by detailed inspection of the samples (an exact measurement of the actual bushing wear, metallographic testing etc.) in order to precisely determine the characteristics of the wear process.