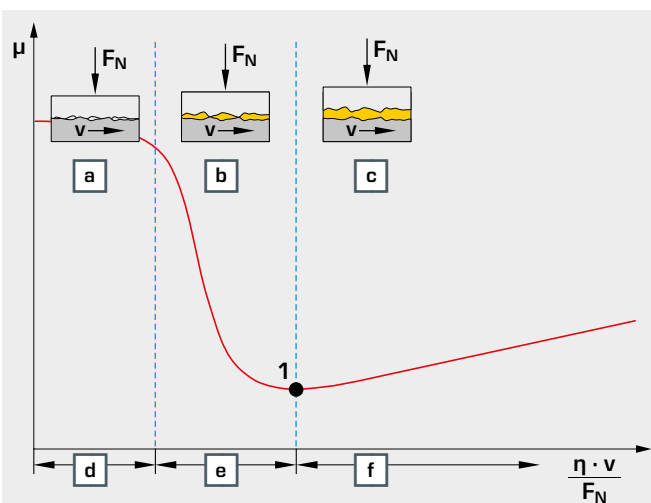
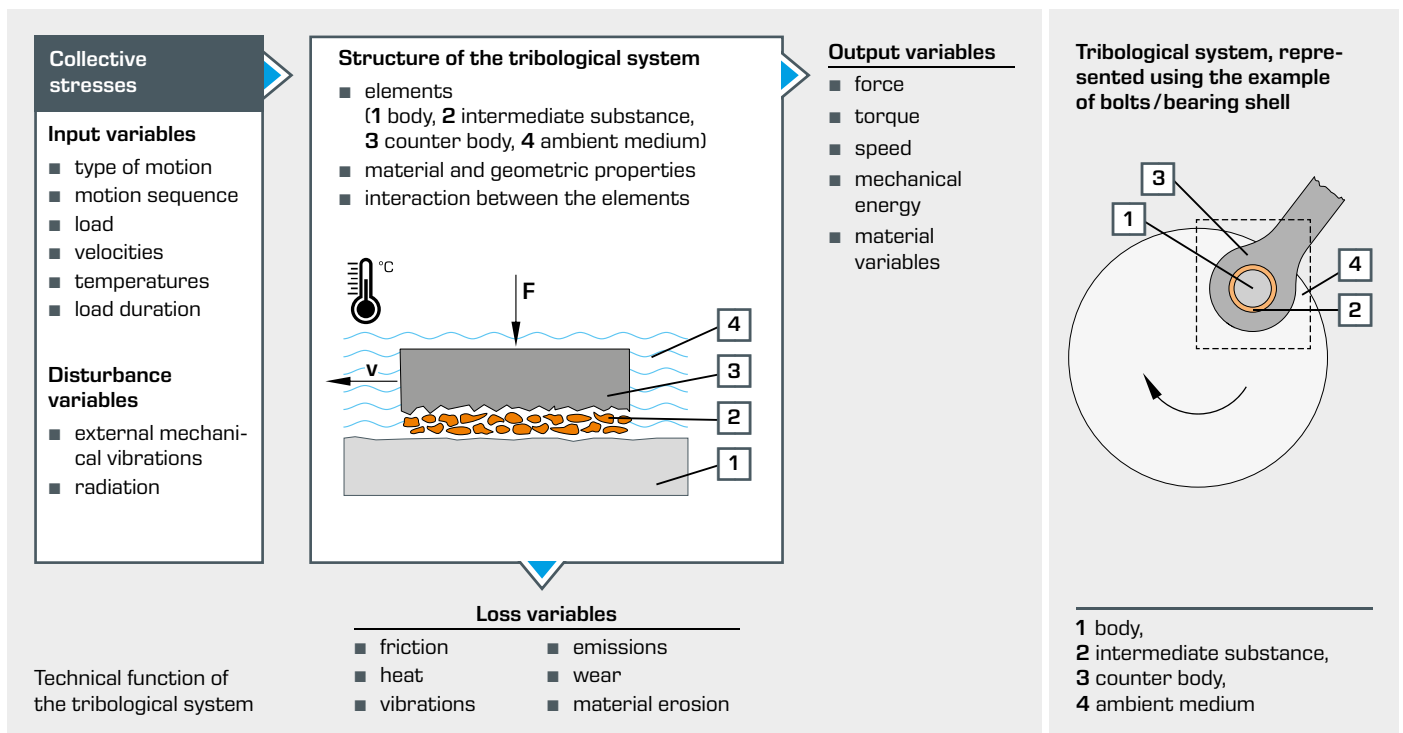


Tribology

Tribology is the science and technology of interacting surfaces in relative motion. The application of tribology in engineering is used to study friction, wear and lubrication. These studies extend to all areas of development, engineering design, production and maintenance of mechanical motion systems. Wear processes are analysed by means of a so-called tribological system and are described by "systemic" loss variables. A tribological system

contains all elements such as components and substances that are involved in a tribological load, as well as their properties. Material components such as body, counter body, intermediate substance and ambient medium form the system structure. The input variables and disturbance variables are summarised as collective stresses.



Stribeck curve for hydrodynamic friction

μ coefficient of friction, n speed, F_N load,
 v velocity, η viscosity,
a dry friction, b mixed friction, c fluid friction,
d boundary lubrication, e thin-film lubrication,
f fluid lubrication, 1 release point

In the analysis of tribological systems, loss variables such as coefficient of friction, frictional forces and frictional vibrations are determined by suitable measuring methods. The change of an input variable or disturbance variable can change the friction and wear behaviour significantly. Experiments are required in order to investigate dependencies of loss variables.

The Stribeck curve gives a good overview of occurring friction states, such as in slide bearings. The relationships between coefficient of friction, friction pressure and bearing force are shown clearly. With increasing velocity, the lubricating film thickness increases and the regions of dry friction, mixed friction and fluid friction, in which the surfaces are completely separated by the lubricating film, are passed through in sequence.

The transition from mixed friction to fluid friction is known as the release point. The lowest wear occurs in the region of fluid friction.