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TRIBOLOGY OF CERAMIC MATERIALS IN DIFFERENT ENVIRONMENTS

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Advanced or structural ceramics are widely used under conditions, at which common steel components fail. Typical application environments are therefore corrosive media (including water) and high temperatures. Therefore not only wear but also corrosion resistances are crucial advantages. After a short introduction on the most important characteristics of ceramic materials and their tribological behavior in different environments, this lecture reviews some own recent research in the fields of

- Tribological behavior at high temperatures under dry friction
- Sliding friction and wear of non-oxide ceramics in water
- Damage evolution in rolling contact contacts

This research was mainly conducted with respect to different applications like metalforming and cutting, slide bearings and face seals for pumps and rolling bearings. Based on the understanding of surface degradation by friction, wear and fracture, which is influenced by both mechanical degradation and chemical reactions with the environment, the most important characteristics are highlighted and potentials and limitations of the use of ceramic components are discussed.