

UNDERSTANDING WEAR MECHANISMS

THE APPLICATION TECHNOLOGY BEHIND WR-STEEL®

IN BRIEF

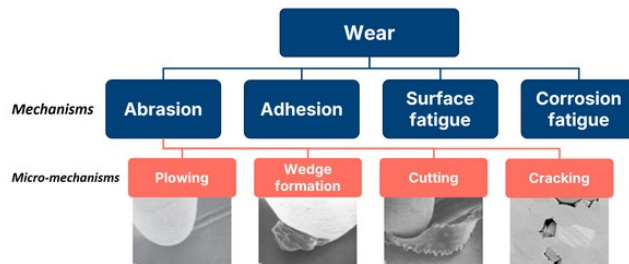
Wear: a life limiting critical factor

Together with fatigue and corrosion, wear is one of the major factors limiting the life and performance of engineering components. Wear causes significant damage and consequently significant costs for industry such as construction, agriculture and mining, resulting from the need for repair or replacement.

Characterizing wear mechanisms

Wear is constituted of different types of mechanisms and micromechanisms affecting engineering components, each of them requiring a specific approach to minimize their effects. Identifying and understanding the dominant wear mechanism that affects a component is thus essential.

It is also important to notice that in most applications, a combination of different wear mechanisms are active and effective simultaneously.



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The challenge of testing wear resistance

Different methods are used to investigate wear resistance. The most common being field work investigation and laboratory testing.



Field work investigation

Accurate and reliable results
Expensive and difficult to implement

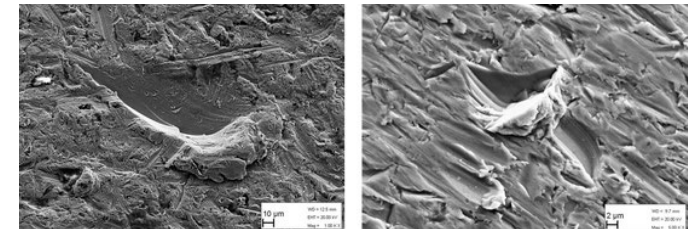
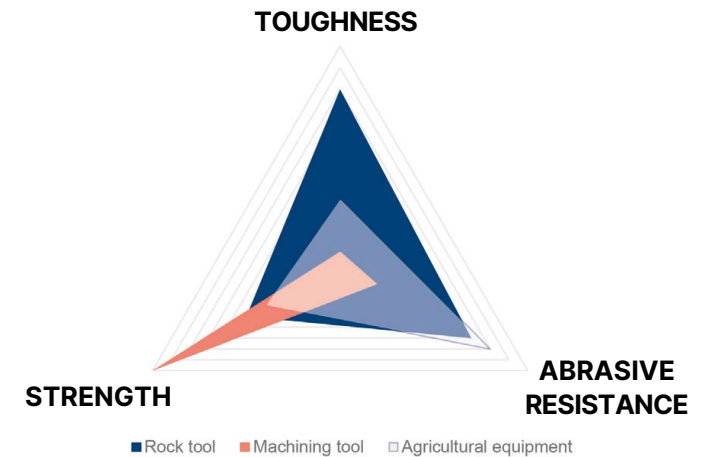


Laboratory testing

Increased repeatability and sustainability
Challenge to reproduce the real field environment

Ovako's wear resistant steel selection method

Given the effects of wear on life and performance of components, the availability of a valid test is vital. Ovako's laboratory wear tests are designed to match the final applications as closely as possible. Three basic parameters, strength, toughness and resistance towards abrasive wear, are considered to assess the global wear resistance of a component. The combined results provide a property zone that can be compared to the application needs. This information can thus be used to help in the selection of the best steel for a specific application.



Erosion/Abrasion wear in the field (left) and in the lab-test (right).

Key messages



Wear is specific to the application and the environmental factors



Wear is a system property

Several properties are needed to cover all wear conditions in an application



Different wear mechanisms can affect a single application



Ovako developed effective laboratory tests to replicate real-life wear conditions

For a better confidence in steels' wear resistance

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