# Article information:

Prediction model for disc cutter wear during hard rock breaking based on plastic removal abrasiveness mechanism | SpringerLink
<https://hfbic1291bd2b93a045d9s9pqp9wbc956k665ffiac.eds.tju.edu.cn/article/10.1007/s10064-022-02915-5>

# Article summary:

1. Tunnel boring machines (TBMs) are widely used due to their advantages, but disc cutter wear is an important factor that needs to be addressed.

2. Researchers have studied the interaction between cutters and rock mass in order to establish a reliable prediction model for cutter wear.

3. Various models have been proposed, such as Teale's rock-breaking performance ratio of cutters, Wijk's TBM tool wear equation, CSM model, NTU model, Wei and Sha's calculation model, Frenzel's wear prediction model, Hassanpour et al.'s empirical model, Tan et al.'s relationship between wear rate and installation radius/radius/penetration depth of the cutter, Wang et al.'s energy equation for a hard rock TBM cutterhead, Liu et al.'s empirical model for evaluating life of large-diameter disc cutters with a rock strength of 40-100 MPa in water conveyance tunnel, Ren et al.'s cutter wear prediction model based on stress analysis and friction energy for TBM tunneling in heterogeneous ground, Su et al.'s disc cutter wear prediction model based on geological indexes and driving parameters of Metro Line 6 in Shenzhen China, Yang et al./Qin et al.'s face cutter wear prediction model through theoretical deduction and mutual verification of field excavation data.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

This article provides an overview of various models that have been proposed to predict disc cutter wear during hard rock breaking using TBMs. The article is well written and provides detailed information about each proposed method. However, there are some potential biases that should be noted. For example, the article does not provide any evidence or data to support the claims made about the effectiveness of each method. Additionally, it does not explore any counterarguments or alternative methods that could be used to predict disc cutter wear. Furthermore, it does not mention any possible risks associated with using these methods or present both sides equally when discussing them. In conclusion, while this article provides an informative overview of existing methods for predicting disc cutter wear during hard rock breaking using TBMs, more evidence should be provided to support its claims and alternative methods should be explored in order to provide a more comprehensive view on the topic.

# Topics for further research:

* Disc cutter wear prediction methods
* Hard rock breaking using TBMs
* Evidence for disc cutter wear prediction
* Alternative methods for disc cutter wear prediction
* Risks associated with disc cutter wear prediction
* Comprehensive view on disc cutter wear prediction

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