

Research on Cutting Tools for Dendromass Processing

by

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RAM-Verlag

2023

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Published by: RAM - Verlag, Germany

Year: 2023

Edition: 1

Impression: 50 copies

Number of pages: 135

Number of figures: 81

Number of tables: 14

Acknowledgements

This research is supported by the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic and of the Slovak Academy of Sciences (VEGA 1/0609/20).

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Publisher:
RAM-Verlag
Stüttinghauser Ringstr. 44
D-58515 Lüdenscheid
Germany
RAM-Verlag@t-online.de
<https://ram-verlag.eu>

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ISBN 978-3-96595-033-7

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ABSTRACT

The aim of the dissertation thesis was to carry out the operational tests of cutting tools with a surface treated cutting edge, in order to determine the amount of wear on the cutting edge of chipping knives. For the experiment, three chipping knives were used: Knife No. 1 - untreated, Knife No. 2 - chemically thermally treated by plasma nitriding, Knife No. 3 - coated with AlCrN CROSAL coating. The wear of the cutting knives, after the operational tests, was evaluated using several methods and procedures, namely, weighing the knives, to find the weight loss caused by the wear after the processing of the wood mass in the volume of $V_h = 1 \text{ m}^3$, finding the wear mechanism of the knives, evaluating the state of wear of the cutting edge of the knives by macroscopic and microscopic light and electron microscopy analysis, and finally, evaluating the state of wear of the knives by 3D scanning of the cutting edges. Knife No. 3 - coated with AlCrN - CROSAL coating had the lowest cutting edge wear and weight loss compared to the other two knives, this gives the assumption of a longer tool life as well as the quality and efficiency of the whole wood chipping process.

Keywords: durability, wear, cutting edge, chipper, coating.

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