Title IN ENGLISH LANGUAGE

**Name and SURNAME of the author – name and SURNAME of the author**

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**ABSTRACT:** Xxxxxx

**Key words:** xxxxxxx

# 1. introduction

Harvester head has an important role in terms of efficiency and quality of wood processing. The task of the harvester head is to fell the tree, branch it, cut the tree to the specified length, and store it in the collection point (Kováč *et.al 2017*). There are a large number of competitive harvester heads on the market today. The main differences are mainly in the maximum diameter of the processed wood, which depends on the robustness of the head, the number of branching knives, the type of feeding device and the assortment of wood.

The post must be formatted in accordance with the template. Contributions are published in English or Slovak. The scope of the contribution may not exceed 10 pages (according to the style of the template), including the list of used literature and appendices. The post must have the following structure.

# 2. TITLE of the chapter

One of the main parts of wood processing during logging is the debranching of trees. This process is often made more difficult by rugged and sloping terrain, so it is best to use mobile delimbing machines with multi-operation heads. Since the diameters of the tree trunks are different during processing, the delimbing knives cannot thoroughly surround the tree trunk. Subsequently, an imperfect debranching process occurs and a delimbing residue or wood damage is created. Therefore, it is necessary to perform mathematical calculations, where we obtain the value of the maximum cutting force Fc when cutting branches.

$F\_{c}=σ\_{D}.S\_{D}.\left(\sin(δ+ μ\_{D}).\cos(δ)\right)$ [kN] (1)

Where:

σD – specific resistance against the compression of wood by the knife face (at an angle δ to the direction of the fibers [kPa]

SD – the contact area of the knife face with the wood [m2]

µD – coefficient of friction of the knife face with wood.

The delimbing mechanism serves to branch the tree trunk. In the case of mining and transport machines, it is most often a knife type (Kováč *et al. 2017*). They are essentially hyperbolically shaped knives, stored in the head or on a telescopic boom. Most harvester heads have one fixed and two movable knives. Between these knives, the debranched log is pulled by means of feed rollers at a constant speed of 2 m.s-1, and its branches are thus cut off. Delimbing knives should be able to copy the shape of the trunk as best as possible (Hatton *et al., 2015*).



Figure 1 Harvester head

1 - fixed frame of the HW60 head, 2 - rotator, 3 - fixed delimbing knife, 4 - upper movable delimbing knife, 5 - lower movable knife, 6 - feeding cylindrical rotators, 7 - length measuring wheel, 8 - cutting unit (chain)

Table 1

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Angle Θ [˚]** | **0** | **20** | **40** | **60** | **80** | **100** | **120** | **140** | **160** | **180** |
|  **σx [MPa]** | 0,131 | 0,105 | 0,075 | 0,042 | 0,035 | 0,044 | 0,062 | 0,065 | 0,039 | 0 |
|  **σy [MPa]** | 0,131 | 0,125 | 0,129 | 0,127 | 0,125 | 0,100 | 0,062 | 0,024 | 0,003 | 0 |
|  **σxy [MPa]** | 0 | 0,0174 | 0,0171 | 0 | -0,026 | -0,048 | -0,054 | -0,036 | -0,011 | 0 |

* 1. **Subsection**

STN 41 9 802 (SLAVIA STEEL s.r.o., Rimavská Sobota, Slovakia) was chosen for the replaceable cutting edge, which was highly alloyed, resistant to impacts, pressure, abrasion and eliminated cracking (Ťavodová and Kalincová *2018*). The use of the material is suitable for high-performance machine tools with medium strength up to 900 MPa for chip machining, such as milling cutters, turning and planing knives and woodworking tools.

# 3. DISCUSION

The analysis was simulated on one separating knife, for which the material and other parameters were chosen, based on the maximum force with which the knives are loaded, and at which points the deformations on the proposed knives are calculated (Bodnár *et al. 2016*; Kotšmíd *et al. 2016*). The strength analysis was designed in the CAD system using the Abaqus FEA method. The Abaqus product is a computer support software package for a newly modeled component that works using the finite element method (Goubet *et al. 2013*). Elements were created on simulated models using hexahedron features.

**REFERENCES**

*Examples of citations (in the Literature section):*

*- for a book publication as follows:*

Kučera, M., Kováč, J., 2012. Degradácia olejových náplní v prevádzkových podmienkach. Zvolen: TU vo Zvolene. ISBN 978-80-228-2427-9.

*- for a magazine article:*

Kováč, J., Krilek, J., (2012). Analýza opotrebovania reznej hrany hobľovacích nožov pílovej reťaze motorovej píly. Acta facultatis technicae, roč. 17, č. 3, s. 147-157.

*- for a chapter in a book or an article in a collection:*

Krilek, J., Kováč, J., Jobbágy, J., (2014). Výskum štiepacej sily na horizontálnej štiepačke. In: Hudec, J. (ed.): Trendy lesníckej a environmentálnej techniky a jej aplikácie vo výrobnom procese : vedecký recenzovaný zborník . Zvolen : Technická univerzita vo Zvolene, s. 225-229. ISBN 978-80-228-2695-2.

In the case of online documents, information identifying the source must be provided with an indication of the exact location on the network.

**Acknowledgement:** *Specify the number and name of the task if it is related to an article.*

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