Innovation and Production of Cutting Tools for Grass Chopper Machines with a Chisel Angle Nomenclature Approach: Pilot Teaching Factory D4 Mechanical Engineering

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ABSTRACT

The people of Kulon Progo Regency have a variety of professions, one of which is raising livestock. To obtain maximum results, animal husbandry must be supported by providing forage with good chopping and in large quantities. This market potential has been captured by UKM Reka Karya Alfahmi in the Kulon Progo Regency area. Various Appropriate Technology (TTG) products were created to support the livestock potential in the region, one of which is the grass chopper machine. There have been several consumer complaints regarding cutting results which have begun to decline in quality and chisels that become blunt easily and corrode on grass chopper machines. The incision process is not sharp causing the incision results to vary. The aim of this research is to innovate and produce cutting tools for grass chopper machines using a tool angle nomenclature approach. The research method used is the Research & Development method. This research method is a method for developing a cutting tool for a grass chopper machine using a tool angle nomenclature approach. The research is focused on designing and manufacturing cutting tools for grass chopper machines in partner SMEs, so the stages in conducting this research are: (1) Process of analyzing cutting tools geometry requirements; (2) cutting tools design; (3) validation and revision of cutting tools designs; (4) cutting tools production process; (6) functional testing of cutting tools on grass chopper machines; (7) final evaluation of cutting tools products; (8) mass production of cutting tools. The data resulting from the design, manufacturing and testing processes are documented and then analyzed and described.
The results of this research are a prototype cutting tool for a grass chopper machine. The resulting cutting tools specifications have dimensions of 123x40x5 mm with cutting tool cutting angles of 38o, 40o and 42o. The heat treatment (quenching) process with oil cooling media is carried out at a temperature of 830 oC with a holding time of 30 minutes. In the next stage, functional testing of the cutting tools on the grass chopper machine will be carried out.

Kata Kunci: *Cutting tools, Grass chopper, Heat treatment, Teaching factory*