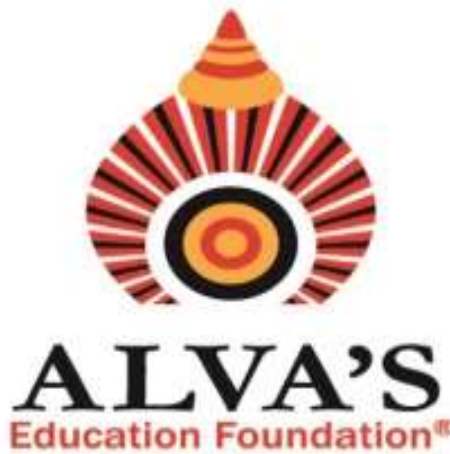




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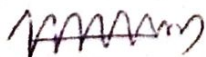
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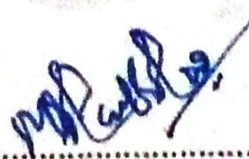
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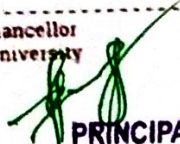
presented on topic titled **An Influence of Substrate Thickness on  
Electrical Conductivity of Dip-soldered Copper Joints**

with Paper ID **MME054** in the 5<sup>th</sup> International Conference on Advanced  
Research in Mechanical, Materials and Manufacturing Engineering (ICAMMME - 2021), held on  
the 9<sup>th</sup> & 10<sup>th</sup> of July 2021.

Co-Authors : **Saurav Manikantan, Likhith Poojary, Vaishnav V.R, Dr. Satyanarayan**

  
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*Title of the Paper* Investigation on Effect of Casting Mould on Tribological and Mechanical Properties of Al-Sn Alloys

*Authors* Mr. Rajath Raj U K, Mr. Saurav Manikantan,  
Dr. Satyanarayan K

  
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*Title of the  
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*Authors*

**Mr. Mithesh Gowda J R, Mr. Rajnish Kumar Mishra, Mr. Sadashiv Bellubbi, Dr. Gajanan M Naik, Dr. Ramesh S**



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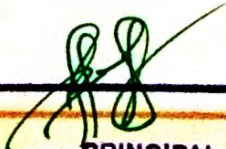
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*Title of the Paper* Behaviour of Mg alloys after the combined processes of ECAP and Hot Rolling

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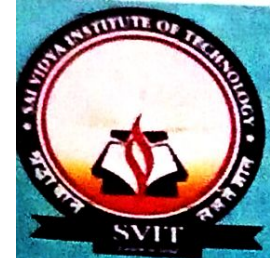
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## Experimental Investigation of Process Parameters on Machining Force, MRR and Power in Turning of AISI 316 Steel

Sadashiv Bellubbi<sup>1,\*</sup>, Vijeath A<sup>2</sup>, Mithesh Gowda J.R.<sup>3</sup>, Karthik Prabhu<sup>4</sup>

<sup>1</sup> Assistant Professor, <sup>3,4</sup> UG Student, Department of Mechanical Engineering, Alva's Institute of Engineering and Technology, Moodbidri-Karnataka, India

<sup>2</sup> Assistant Professor, Department of Metallurgical Engineering and Safety, Rajiv Gandhi Institute for Steel Technology, Toranagallu-Karnataka, India

### ABSTRACT

A machining process involves many process parameters which directly or indirectly influence the surface quality of the product. A precise knowledge of these optimum parameters facilitate reduce the machining costs and improve product quality. Current investigation aims to investigate the effect of process parameters; cutting speed, feed and depth of cut in turning of SS-316 which is widely used in automobile industries, each varying in three levels. The response characteristics considered for study were machining force, material removal rate and power. Experiments were planned according to Taguchi full factorial design using L<sub>27</sub> orthogonal array. The machining was carried out using cemented carbide cutting tool and various forces acting on the cutting tool were measured using lathe tool dynamometer. Results indicated that cutting speed and tool feed rate have a significant effect than that of depth of cut on the quality characteristics.

**Keywords:** Cutting forces, machining force, MRR, power

**\*Corresponding Author**

E-mail: bellubbisadashiv@gmail.com

### INTRODUCTION

Austenitic stainless steel is one of the most important engineering materials with wide variety of applications. Superior resistance to corrosion and compatibility in high temperature and high vacuum has particularly made it an attractive choice. Grade 316 is the standard molybdenum-bearing grade. Molybdenum gives 316 better corrosion resistance properties than crevice corrosion in chloride environment. It has excellent forming and welding characteristics.

As P 30 grade of cemented carbide would provide excellent balance of hardness, wear resistance and toughness, the same grade

has been chosen for machining of stainless steel as cutting tool. Also effect of cutting speed, feed, and depth of cut on various characteristics during machining of austenitic stainless steel was studied. According to Ciftci (2005)[1] AISI 316 resulted in higher forces at all cutting speeds employed than AISI 304. Zhuang et al. (2010)[2] studied on two steels, free cutting austenitic stainless steel and austenite stainless steel 1Cr18Ni9Ti at various cutting speeds; they find that the cutting forces generally decreased with the increase of cutting speed in the range 10 – 80 m/min. They reached 418 N and 336 N at 10 m/min cutting speed for steel A and B respectively and at cutting speed of 80



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*M Hamaguchi*

HAMAGUCHI MICHINARI, MD., PH.D.  
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Bor-Tsuen Lin

prof. Bor-Tsuen Lin  
Dean, College of Engineering  
National Kaohsiung First University of Science and Technology  
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# Solar Desalination Using Phase Change Materials and Vacuum Pump

Kiran C H<sup>1</sup>, Chetanakumara Veerabhadrappe U<sup>2</sup>, Chethan H N<sup>3</sup>,  
Madhu M S<sup>4</sup>, Maruthi H T<sup>5</sup>.

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**Abstract**—estimating the growth of population and industrial development leads to demand of water resources. Water resources covered the one third of the earth, in these less than 1% is suitable for industrial and domestic uses. With rapid growth of population, industrial development leading to deforestation and declination of water. This leads to scarcity of drinking water for growth of population. To overcome the crisis an alternate solution is rain harvesting and desalination. Because of the climate change due to pollution rainfalls is decline year by year. so desalination is better solution for this crisis. It is estimates that 22million m<sup>3</sup> of freshwater being produced per day by desalination process in worldwide, but only 1% is due to solar energy. Direct and indirect methods are used for desalinate the sea water to the freshwater. Most of the methods like desalination, Multi stage flash distillation and reverse osmosis, are energy depended and consume electric power and fossil fuels. Demands water is more so supply should be less expensive, so solar desalination is better compared to conventional methods. The main objective of the proposed project is that by using free energy converting the saline water to the necessity water by using principle of the thermal and low pressure vessels leads to change in latent heat and sensible heat. Possible outcome is to provide suitable combination to get better yield of drinking water from saline water. The efficiency of solar still varied for the beam radiation of 312.5 W/m<sup>2</sup> to 925 W/m<sup>2</sup>. A maximum distilled yield is 1.5 to 2.2 ltr/day is obtained with 0.54 m<sup>2</sup> area.

**Keywords:** Saline water, low pressure vessel, solar energy, Desalination, direct method, Heat energy storage, Phase change material.

## I. INTRODUCTION

### A. General

Water is the major fundamental for the life to sustain Earth's composition consists of 97.5% of water is regarded as the sea water (brackish water) and the 1-2% is available for domestic's usage. According to the world health organization (WHO), it is necessary for person to have a minimum water consumption of 15-20 L for the basic needs.

Water is a basic necessity of man along with food and air. Fresh water resources usually available are rivers, lakes and underground water reservoirs. About 71% of the planet is covered in water, yet of all of that 96.5% of the planet's water is found in oceans, 1.7% in groundwater, 1.7% in glaciers and the ice caps and 0.001% in the air as vapour and clouds, only 2.5% of the Earth's water is freshwater and 98.8% of that water is in ice and groundwater. Less than 1% of all freshwater is in rivers, lakes and the atmosphere.

Human beings need 1 or 2 liters of water a day. The minimum requirement for normal life in developing countries (which includes cooking, cleaning and washing cloths) is 20 liters per day. Drinking water with acceptable quality has been unevenly distributed worldwide.







# Pedal Operated Areca Nut Peeling & Crops Dehusking Mechanism

Sadashiv Bellubbi<sup>1</sup>, Umesha<sup>2</sup>, Shivaling Y. Argi<sup>3</sup>, Shantkumar<sup>4</sup>, Manjunatha DV<sup>5</sup>

<sup>1</sup> Assistant Professor, Department of Mechanical Engineering, AIET, Moodabidre, Karnataka, India-574225

<sup>2, 3, 4, 5</sup> UG Student, Department of Mechanical Engineering, AIET, Moodabidre, Karnataka, India-574225

**Abstract**—Agriculture is the one of the basic source to the formers. However the dehusking crop is done manually by using sharp edges. By this method the production rate is low and the consumption of time is more. So it is necessary to develop an agricultural machine to increase the production rate and to decrease the time consumption. There are many number of crops are available in India like Areca, soya, green gram, tur, moong. Currently few machines are available for dehusking the crops. But machines which are available in market are not affordable by normal people due to their high cost and high maintenance. In order to overcome these problems this project is proposed, in this device the pedal operated mechanism is incorporated. In this Potential energy of human is converted to kinetic energy and utilized the same. The machine assembly consist of pedaling mechanism hence it is affordable to everyone. The dehusking is made by the rotating of the driving shaft which consists of sharp edges on its periphery. The pedal is operated by manually which rotates the driving shaft with the help of chain sprocket and gear drive. This mechanism can be used to accommodate different size of various crops are cultivated anywhere in the world. This work mainly concentrating on peeling of areca nut.

**Keywords**— Pedal operated mechanism, Areca nut dehusking.

## I. INTRODUCTION

Farmers are the backbone of the country, out of 1.2 billion total population, the farmers in India is 600 million i.e. 50% of total population [4]. In order to enhance their crop production it is necessary to implement the new technologies and new concepts to be applied. The main crop of the country is areca, soya, moong, tur, green gram etc. Farmer cultivates the crops and they investing more than 20% of their profit for the dehusking. The manual dehusking process shown in fig. 1 by this method the production rate is very low and labour cost is more. Farmers are struggling on manual method of dehusk, so in order to overcome the problem this project had initiated.



Fig. 1. Manual dehusking.

**Objectives:** Objective of the project is to develop a mechanism for dehusking of crop like areca nut, moong, tur, soya etc. These problems can be overcome by developing a machine

which can efficiently and economically dehusk the crops. The machine should be able to accommodate various crops and it must also be easy to operate, eliminating the need of skilled labour.

## II. DEVELOPMENT OF MECHANISM

The mechanism consists of rotating shafts with blade, rough surface hollow tube, bearing, hopper and frame.

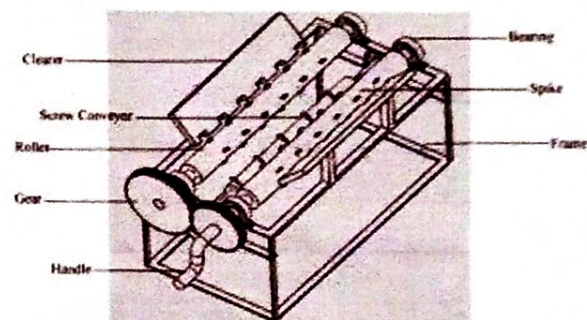


Fig. 2. Schematic representation of proposed work.

## III. CONSTRUCTION OF WORKING MODEL

The blade is an important part of this mechanism with sharp edges to cut the crops. The material used is mild steel for withstanding different load condition. The blades are placed on the periphery of the 2 rotor shaft at an angle of 45°.

Specifications of blade:

Width: 30mm

Length: 320mm

Specifications of blade:

Width: 30mm

Length: 320mm

Thick: 3mm

Material: Mild steel



Fig. 3. Pedal operated crop dehusking mechanism.





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# MICROSTRUCTURE AND WEAR BEHAVIOUR OF MATRIX Al7075 REINFORCED WITH MICRO WC-Co PARTICULATE COMPOSITE PROCESSED BY STIR CASTING METHOD

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**Abstract:** - The present work dry sliding wear behaviour of Al7075 alloy matrix composite reinforced with 9Wt.% of WC-Co particulates is examined after prepared by stir casting. The dry sliding wear behaviour was studied for the composites with parameters of varying sliding speed, load and sliding distance. Microstructure characterization is done using SEM/EDX studies for the composite samples. From microstructural characterization even distribution of WC-Co particulates is observed in Al7075 matrix. DUCOM wear testing machine with EN32 steel disc is used to evaluate the wear rate of the composite. Worn out surface of the composite is subjected to SEM analysis to observe the layer formations. From the results of wear studies it is observed that the composite wear rate is reduced by restricting dislocation between the matrix and reinforcement interface.

**Keywords:** Al7075, WC-Co, SEM, Dry sliding wear

## 1. Introduction

The advancement of composite materials was fixated on the requirement for consolidated weight and improved execution properties in applications for military, car, aviation, and space vehicles. The advances in structure and computerized fabricating techniques have brought down their creation costs and extended their utilization for high volume applications in aviation and non-aviation sectors. [1-2]. Which incorporate development materials, for example, plain sheets, water tanks, restroom machines, home fittings, furniture industry, corrosion resistant compartments, angling vessels, mechanical items, portions of hardware, electrical industry, car parts, motor housings, vehicle seats and pedal mounting etc. Also, a few particulate reinforcements like SiC, Al<sub>2</sub>O<sub>3</sub>, TiC, B<sub>4</sub>C, WC and TiO<sub>2</sub> are used for Al matrix as strengthening particulates [3]. In the aviation area, advancement or weight decrease assumes a significant job. Since, an airplane's presentation is straightforwardly relative to the airplane weight. It is in this manner important to create lighter structures or segments so as to give the essential quality and unbending nature in the base cross-sectional region. Metal grid composite has a significant influence in this specific region [4, 5]. A few processing methods like powder metallurgy, mechanical alloying and other various techniques including spray deposition technology have produced particulate strengthened metal matrix composites. Stir casting method is customary as a traditional process which is economic, the scope of procedures set up accessible for intermittent metal matrix composites. Its advantage lies in its effortlessness, adaptability and relevance for the preparing of huge amounts. It is the generally cheap of every single open course to produce metal network [6-7]. Mechanical examinations, for example, hardness, ductile, pressure and power of effect have been assessed particularly. A few parts utilized in a mechanical application experience sliding or pivoting movement, where the two segments slide together. Composites with more wear-resistance should be developed. The aim of this paper is to understand the effect on wear properties of Al7075 alloy by micro size WC, Co particle reinforcement. Wear experiments were carried out using pin-on - disc wear devices made by DUCOM. The influence of load applied, sliding speed, and sliding speed on the behaviour of composites Al7075-WC-Co was studied.

## 2. Experimental Details

