A REVIEW ON OPTIMIZING CUTTING PARAMETERS FOR HOT TURNING.

Vaibhav Kamane[2], Saurabh Yende[3], Satish
Rahangdale[4], Sarang warambhe[5], Shubham Bijewar[6]
[2,3,4,5,6]Student, JD college of Engineering and Management, Nagpur, India.

Abstract :- The surface Quality is the most important factor in any machining process, for obtaining these quality we use many methods. Turning is one of the machining process which involve the following cutting parameters, i.e, cutting speed, Depth of cut, feed rate and spindle Speed. By improving these cutting parameters we can increase the Surface quality of the product.

Hot turning is the process in which we heat the workpiece material just above the recrystallization temperature and perform the turning operation multiple time and obtain the reading. We found that cutting speed and feed rate are most effective and important parameters in cutting.

Keywords :- Hot turning, Cutting Parameters, Workpiece temperature.

INTRODUCTION: - Machining is the important process of manufacturing by which we can obtain the High dimensional accuracy and surface finish. Every material has different hardness which impact on the machining process. In turning process when we get material of high hardness, it is difficult to machine it. i.e, it damage the tool and tool life decreases and also the desired surface quality is not obtain.

To overcome these problems we use the hot turning process. In hot turning process we heat the workpiece material by using some flames due to these material losses it strength and get ductile in nature due to these the turning operation is done efficiently.

Discussion:- The Experiment is perform on the Lathe machine. N.Tosun and L.ozeler take M20 sintered carbide as a tool and high mangneze steel material as workpiece material. These workpiece material has a hardness 243HB. In these case material is heated by using liquid petroleum gas and temperature is controlled by using temperature control unit and temperature is measured by using temperature measurement device. Taguchi method has used in these case. The experiment is performed in the three levels. Based on ANOVA method we found that cutting speed and feed rate are the more effective parameter than the depth of cut and workpiece temperature.

Different types of Flames and methods for Heating Material.
1. Mixture of Oxygen and liquid petroleum
2. Plasma Arc Heating
3. Acetylene + Oxygen
4. Mixture of LPG oxygen gas
5. LPG
6. Plasma arc heating and oxyacetylene
7. Electric current, high frequency induction

Method use
1. Response Surface Methodology(RSM)
2. Taguchi Method

3. Finite element Analysis(FEA)

4. L9 orthogonal array

5. Factorial experimental design

6. ANOVA analysis

Literature Review

PAPER NAME	AUTHOR NAME	FINDING
Modelling of machine parameters affecting flank wear and surface roughness in turning of Monel-400 using response surface methodology	Asit kumar Parida and kalipada maity 2019	Temperature affect flank wear ,cutting speed affect surface roughness.
Optimization of multi responses in hot turning of Inconel 625 alloy using DEA-Taguchi approach.	A.K. Parida, K. P. Maity 2016	The best alternatives & ability hold the multiplicity of inputs & outputs.
Experiment Investigation by using Hot turning for die steel.	Varun Shekhar, 2016	Best machining parameters to High cutting force and surface roughness.
Tool damage & machined-surface quality using hot-pressed sintering Ti(C7N3)/WC cermet cutting inserts for high speed turning stainless steel.	Bin Zou, Huijun Zhou	cutting speed has the most dominant effect on tool life.
Evaluation of machining parameter turning of stainless steel applying ANN and RSM.	S. Ranganathan, T. Senthilvlan, G. Sriram	The surface roughness valve of hot turned component 200^0 raised temp:400^0

Conclusion:

In these paper we have studied about cutting parameters and find that the cutting speed feed rate are dominating parameter than depth of cut and workpiece material.

References

1. Asit Kumar Karida and Kalipada maity,2019

2. A. k. Parida, K. P. Maity

3. Varun Shekhar

4. Bin zou, Huijun Zhou

5. S. Rangnathan, T. Senthilvlan, G. Sriram