

Review: Design of Cutting Fluid Filtration System

Prof. Rahul Deshmukh¹ Shubham J. Kamble² Sumit Lute³ Kunal Janbandhu⁴ Pawan Dhage⁵

¹Guide ^{2,3,4,5}Student

^{1,2,3,4,5}J.D.C.O.E.M, Nagpur

Abstract— The Cutting fluid is used in the lathe machine and various machine to reduce the friction and temperature. After operation the fluid contain so many abrasive particle and scrap material and dust mixed in it and the fluid has reduce its quality and viscosity. So this paper highlights the work of such cutting fluid separation in which the oil can be recycle by filtering all the unwanted particles and reuse it again.

Key words: Steel Screen Filter, Nylon Filter, Overfill Protection Filter, Refining Fluid

I. INTRODUCTION

The cutting fluid filter concept introduced in the industry to reduce the wastage of oil and recycle this oil by filtration. The cutting fluid filtration is a device or machine which filter the oil that contain abrasive scrap and dust and unwanted particles. Which reduces the quality of the cutting fluid as well as viscosity. Also there is another major problem with this fluid is that the huge amount of used oil is being wasted. Because of this the oil requirement is high and due to this cost of fluid is also high. To avoid this cutting fluid separator can beneficial to reduce the requirement of the cutting fluid. So now a days researchers concentrated towards the cutting fluid filtration system which helps to reduce the disposal of used oil. And also help to reduce the cost of machining. The machine is useful to restore the desirable properties of the fluid. It also helps to drawn out the nonferrous impurities from the fluid with the arrangement of metallic filter.

II. COMPONENTS

The some common components used in the cutting fluid filtration system are used.

A. Steel screen filter

This filter can be used for several different projects. This stainless steel filter mesh screen are ideally suited for use in applications where there is a need of high strength chemical resistant filter.



Fig. 1: steel screen filter.

B. Nylon Net filter

This filter is commonly used in various industry for cleanliness analysis. It is compatible with a broad range of solvent.

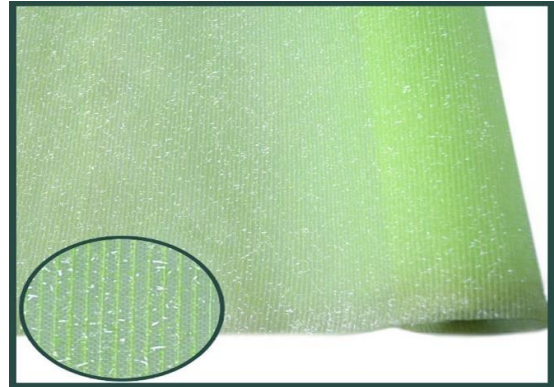


Fig. 2: Nylon net filter.

C. Storage tank

In this tank the filtered oil is put and making it to use again. The capacity of the tank is vary with respect to the volume filter within an hour.



Fig. 3: storage tank

D. Funnel

The convergent type funnel is used to pour the oil and it also covered with net to avoid major particles from goes inside the centrifuge cleaner.



Fig. 4: funnel

E. Pump

Pump is required to send the fluid for the next container and also used in various used for pump the fluid.



Fig. 5: pump

F. Motor

A motor is used to drive the shaft of rotor. The motor specification may vary with respect to the requirement of the capacity.



Fig. 6: motor

III. LITERATURE STUDY

Milacron marketing LLC [1], Proposed the complete detail about the filter used for the cutting fluid and types of metallic filter which used to separate cutting fluid. Also in these report they explained about metal working fluid controls which gives an idea of proportion of the water and oil mixed together for obtaining a desired cutting fluid properties.

S.M. Mehdi & R.O. Skold [2], present in their paper they concentrate on the water soluble metalworking cutting fluid and filtration of this cutting fluid to reuse it again in the same machine. They consider the water based fluid in their experiment and over this they perform filtration technique.

M. A. El Baradie, [3], proposed cutting fluid is widely used by machine users so to reduce the heat and wear. With the help of filtration of the cutting fluid it can reuse the metalworking fluid. Due to regaining the desire properties of the used fluid it can use this oil for further uses.

Mr.S.D. Chavan ME, and Prof. A. V. Karande Ass. Prof. [4], Proposed the design and FEA analysis of the modified oil cleaner. In this cleaner it helps to clean the contaminants from the fluid. Cleanliness of the fluid is a vital problem and it have to be free of particulate materials such as metal chips, dirt etc.

Tony helmich Eriez [5], present in his paper that magnetic separation is a recognized technique in the bulk handling industry. A magnetic cutting fluid is an industrial tool which creates a powerful magnetic field which helps to separation of metal material so the metal parts are remove from the oil with the help of the magnetic separator.

IV. CONCLUSION

We studied different method to recycling the cutting fluid. And it helps to increase the life of cutting fluid. But the machine are very costly and the output fluid quality is not properly described with their research paper. With this we can improve the method of filtration to get excellent quality of cutting fluid.

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