

## Design and Development of a system for enhancing the life of the WEDM Filter

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**Abstract.** WEDM is an important component of the manufacturing and production industry. These types of machines are used where there is need for high precision and accuracy required. The diameter of the wire used for the cutting operation can be of 0.25mm and cuts the scraps material at the range of  $10^{-3}$  to  $10^{-5}$ . WEDM uses different types of filters based on its type of design and storage for dielectric fluid and space requirement. This article focuses on designing a system which aim to increase the life of the filter which are present in the machine. the life of a filter depends on various factors velocity of flow, type of scrap, scrap size, properties of the scrap and the concentration of the scrap in given volume. the system focuses on enhancing the life of a paper filter which is usually replaced after some weeks due to clogging, so by introducing a system which can increase the replacement time without affect the convectional processes. As the workpiece usually consists of ferromagnetic and diamagnetic materials they can be easily separated with a help of a magnetic system. Permanent magnets can generate a field upto 1.2T while electromagnets can go a step further at 2T or 5T but as they require electric supply they will be not considered. This ability of magnets can play a major role for development of various applications.

### Introduction

WEDM Filter are a common type of machining choice when there needs a precise cut and geometric accuracy are needed. There have been a various methods used in improving the performance of Wire electric discharge machine. From using various types of automation to using different dielectric fluid a lot of innovative process has been tried. The performance of filter has enhanced or improved, and production process has increased. But one component of EDM has not yet been studied or properly modified that is EDM Filter. There has been very less work done in replacing EDM Filter or enhancing its performance. Magnetic filter is one of the alternatives to Conventional Filter that is been used it is found to be more efficient but for it the whole conventional filter must be replaced which could prove to be expensive for industry. The main motivation behind taking this project was to not replace the conventional filter completely and to also use the magnetic technology which magnetic filter provide.

So, the main motive is to create a system which uses magnet as well as enhances performance of filter and is at reasonable cost. Magnets being easily available in this current market and making them work in the system makes its non-energy consumable. The newer technology in filter focuses on centrifugal cleaning or sand filter which are very common in filtration.



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