

# A Review on 360 Degree Flexible Rotating Drilling Machine

Kamli Harsh<sup>1</sup>, Parth Mistry<sup>2</sup>, Patel Akash<sup>3</sup>, Patel Ankit<sup>4</sup>, Patel Hemik<sup>5</sup>, Priyang A. Mistry<sup>6</sup>

<sup>1,2,3,4,5</sup>Student, Department of Mechanical Engineering, S.S.A.I.E.T, Navsari, India

<sup>6</sup>Assistant Professor, Department of Mechanical Engineering, S.S.A.I.E.T, Navsari, India

**Abstract:** Directional drilling machine which can be used based on drilling holes in various location and movement and easily operation done with high accuracy. In 3-Directional drilling machine which can be used based on drilling holes in various location and movement and easily operation done with high accuracy. Some parts cannot drill due to small work space between drill bit and work piece. So we use hand drills in this cases but it cause alignment problems. So here i propose a 360 degree flexible drill that can be mounted on a table or wall and can be used to drill holes horizontally, vertically or even upside down. So this make it possible for easy drilling in even complicated parts and surfaces.

**Keywords:** Drill dimensions and potable machine

## 1. Introduction

Drilling machine is one of the most important machine tools in a workshop. It was designed to produce a cylindrical hole of required diameter and depth on metal work pieces as well as similar operations. Drilling can be done easily at a low cost in a shorter period of time in a drilling machine. Drilling can be called as the operation of producing a cylindrical hole of required diameter and depth by removing metal by the rotating edges of a drill. The cutting tool known as drill is fitted into the spindle of the drilling machine. A mark of indentation is made at the required location with a centre punch. The rotating drill is pressed at the location and is fed into the work. The hole can be made up to a required depth. Drilling is the method of making holes in a work piece with metal cutting tools. Drilling is associated with machining operations such as trepanning, counter boring, reaming and boring. A main rotating movement is common to all these processes combined with a linear feed.

There is a clear distinction between short hole and deep hole drilling. The drilling process can in some respects be compared with turning and milling but the demands on chip breaking and the evacuation of chips is critical in drilling. Machining is restricted by the hole dimensions, the greater the hole depth, the more demanding it is to control the process and to remove the chips. Short holes occur frequently on many components and high material removal rate is a growing priority along with quality and reliability.

*General Aspects of 360 Degree Drilling Machine:*

Drilling is the operation of producing circular hole in the work-piece by using a rotating cutter called DRILL. The machine used for drilling is called drilling machine. The drilling

operation can also be accomplished in lathe, in which the drill is held in tailstock and the work is held by the chuck. The most common drill used is the twist drill. It is the simplest and accurate machine used in production shop. The work piece is held stationary i.e. clamped in position and the drill rotates to make a hole. Drilling machine is kind of machine rotating cutting tool which direction the drill feeds only on the machine axis. Drilling is operating while producing round holes in the piece work by using a rotating cutter called DRILL.

A Drill is a tool fitted with a cutting tool attachment or driving tool attachment, usually a drill bit or driver bit, used for boring holes in various materials or fastening various materials together with the use of fasteners. The attachment is gripped by a chuck at one end of the drill and rotated while pressed against the target material. The tip and sometimes edges, of the cutting tool does the work of cutting into the target material. This may be slicing off thin shavings grinding off small particles crushing and removing pieces of the work piece, countersinking, counter boring, or other operations.

Drills are available with a wide variety of performance characteristics, such as power and capacity. Drill machines have been the heart of every industry. Drilling holes in parts, sheets and structures is a regular industrial work. Perfect and well aligned drilling needs fixed and strong drills. Some parts cannot be drilled using fixed drills due to low space between drill bit and drill bed. We need to use hand drills in such cases but hand drills have alignment problems while drilling. So here we propose a 360 degree flexible drill that can be mounted on a table or wall and can be used to drill holes horizontally, vertically or even upside down. So this makes it possible for easy drilling in even complicated parts and surfaces. Thus we use rotating hinges and connectors with motor mount and supporting structure to design and fabricate a mini 360 degree drill for easy drilling operations.

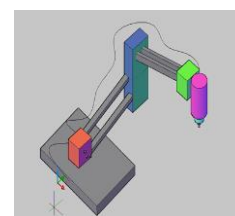


Fig. 1. Drill

### A. Advantages of drilling machine

Price will be much cheaper as compared to other available in market, the presently available smallest radial drilling machine will cost approximately 1.5 lacs but this machine costs only 40000 rupees.

While drilling, complex drills can be achieved with high accuracy.

- It is a multifunctional portable machine.
- The sixth degree of freedom is an added advantage of using this machine.
- Helping the needy small scale industries had been our main goal and we have succeeded in providing a simple solution which has a huge scope to be improvised in the near future.
- The machine design with furthermore up gradation is a new step towards evolution of drilling machine, and would compete the presently available model.

### B. Disadvantages of drilling machine

- Drilling manually, which is time consuming process and is a hectic job.
- Drilling machine available in market is costly and small scale companies cannot afford it.
- In a radial arm drilling machine can only rotate up to 270 deg. about its base.
- Work part should always be smaller than its work table form it perform the drilling operation.
- It is less portable because of being very heavy.
- Cost of machine is high.
- Maintenance of machine is also high.
- Difficult for the small scale companies to afford the costlier machines.

## 2. Literature review

R. Anandhan, P. Gunasekaran, D. Sreenevasan, D. Rajamaruthu (2016) Main objective is rotated to easily drill at any direction. So that job setting operation is not complicated as well as reduces the setting time for the operation.

Sergej N GrigorievGeorgi, M. Martinov, Materials like wood, plastic and light metals can be drilled with this. The work piece is fixed on the work table, which is provided with a moving arrangement. The drilling machine is one of the most important machine tools in a workshop. In a drilling machine holes may be drilled quickly and at a low cost. The hole is generated by the rotating edge of a cutting tool known as the drill, which exerts large force on the work clamped on the table. (2010)

The objectives of this project are to provide broad opportunities of the CNC system for the multi-axis machine. Using this system it allows the control system software to be independent from the specifics of the system.

Nandewalia Prajall, Malaviya Krunal, Prof. Chauhan Hiral, Prof. Vipul Goti (2018) Main purpose is to reduce time

and vibration in drilling operation. Drilling machine is compact and flexible. This drill machine can drill graphically in all directions, it can rotate radially on X-axis and Z-axis. In this way we can drill in any direction 360 degrees. We can drill approximately in any material like wood, metal, etc. As it is a compact machine, we can carry it anywhere and can use it. We can do all the required job with this machine as it is done with any other conventional drilling machine.

IL.M. Aage, 2Kanchan Badgujar, 3Rutik Hylinge, 4Pratik Khodade (2017) To make radial drilling machine for the drilling of different sizes straight & angular cylindrical holes as per requirements for industry.

The conventional drill machine has two main parts first drill head & another is drill table. Assembly normally involves tedious work while adjustment of drill table during job holding also there is problem in inclined hole drilling. To overcome this problem we can do the project on design & fabrication of 6-ways drilling machine table with auto feed drill machine which is capable of drilling straight as well as inclined hole.

Vandana N.Mahajan,May (2017)

- To develop more understanding about development and principle of CNC machine.
- To learn various types of modern CNC machines and CNC modes of machine.

In this paper we investigated influence of various optimization parameters on surface finish which can be used in industries in order to select most suitable parameters combination in order to achieve the required surface finish.

Dinesh awari, Manoj bhamare, Jagdish chahande (2012) Easily operable. Easy interface. Flexible. Low power consumption. Clear, easy to follow design. Comprehensive construction and operation manual. It should be available for educational purpose at low cost. It will be easy to maintenance.

With the increasing no. of small scale industries demand for small scale, high precision parts in various industries, the market for small scale machine tools has grown substantially. Using small machine tools to fabricate small scale parts can provide both flexibility and efficiency in manufacturing approaches and reduce capital cost, which is beneficial for small business owners. In this paper, a small scale three axis CNC drilling machine's component discuss and analyzed under very limited budget.

R. John Stephen (2015) It Is Expected That This Condition Is Best Suited for Obtaining the Optimal Machining Parameters (Spindle Speed, Feed and Depth of Cut) To Achieve Good Quality Surface Finish. For A High Depth of Cut, The Material Removal Rate Increases with Increase in Cutting Speed. Better Surface Finish Is Produced by Machining PVD Inserts.

## 3. Conclusion

This paper presented an overview on 360-degree flexible rotating drilling machine.

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