

# Small Thread Attachment for Internal Threading on Lathe Machine

Kanhaiya Kapase<sup>1</sup>, Shreyas Kulkarni<sup>1</sup>, Aniket Karande<sup>1</sup>, Dr. Mangesh Mankar<sup>2</sup>

<sup>1</sup>BE student, Dept. Mechanical Engineering, Suman Ramesh Tulsiani Technical Campus Faculty of Engineering, Kamshet.

<sup>2</sup>Assistant Professor, Dept. Mechanical Engineering, Suman Ramesh Tulsiani Technical Campus, Faculty of Engineering, Kamshet.

\*\*\*

**Abstract** - It is needed to adopt new ideas for the time saving and to achieve higher production rate. internal threading Technologies represent a critical step in the production of high Precision Parts for strategic industrial materials. For internal threading process, the lathe machine should have the provision for the internal thread cutting.

Some lathes have provision for internal threading but some do not have the provision. But in many industries, the internal threading operation has to be done separately. For that, the attachment will be useful for the company to increase their profits.

**Key Words:** Lathe machine, Internal threading, Spindle, Pulley, Design of components.

## 1. INTRODUCTION

A thread is a uniform helical groove cut inside of components usually cylindrical, or on the outer surface of cylinder.

There are two types of threading

1) Internal Threading

2) External Threading

The internal threading is to thread on the inside of a pipe, fitting, or machine screw. There are number methods of cutting threads, including subtractive methods, or transformative methods additive methods Thread cutting, as compared to thread forming and rolling, is used when full thread depth is required, when the quantity is small, when the blank is not very accurate, when threading up to a shoulder is required, when threading a tapered thread, or when the material is brittle. A common method for creating threads is cutting with taps and dies. Drill bits removes the chips automatically they create but hand taps do not. A hand tap creates long chips hence cannot cut its threads in a single rotation which can jam the tap (crowding). Therefore, in thread cutting, normal wrench usage is to cut the threads 1/2 to 2/3 of a turn, then the tap is reversed for nearly 1/6 of a turn until and unless the chips are broken by the back edges of the cutters. It may be needed to remove the tap

from the hole especially when there is operation of threading of black hole.

## 1.1 Internal and external threading

The internal threading is to thread on the inside of a pipe, fitting, or machine screw. Turn the handle of the wrench to widener the jaws, fit the threading tap with with single groove to start.

The external threading is to thread on the outside of a pipe, fitting, or machine screw.

## COMPARISON OF THREAD CUTTING

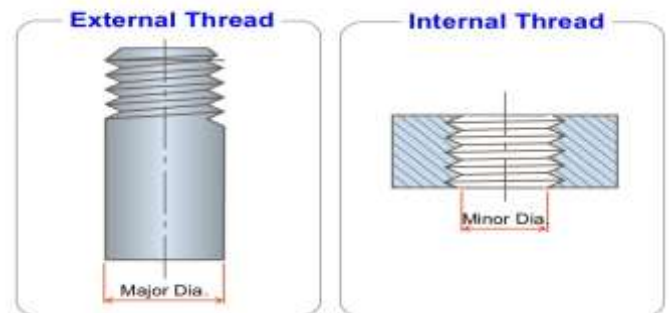


Figure.1 Internal and external threading

## 2. Literature Review

**Nuruden A. Raji** Based on literature review, after the optimization of belt driving and driven, it is concluded that the driven pulley size has large impact on the output as compared to the driving pulley in order to get the optimal output. The contour plot of driven and driving pulley to the power output clearly shows that the optimal output is got between the range of 250-500 mm of radius for driven pulley and 550-900 mm of radius of driving pulley, while other constraints such as belt tension, centre distance kept the same. The optimal power output was at the radius of 846mm and 486mm for driving and driven pulley respectively, and the optimal power output was 1418.76kW for the mentioned pulley sizes. Further author suggests that the for heavy duty applications the number of belts and pulleys can be used and optimized for industrial applications using the same procedure of varying the pulley sizes. [1]

**P.S.Valsange** Based on literature review, the fatigue strength of spring largely depends upon the parameters like material of spring, design procedure of spring, impurities in the material selected for the spring, geometry of spring and also the surface imperfection. Researcher used FEA model in corrosion for the analysis in linear quadrilateral element for the imperfection study. Based on the study, it is concluded that the strength gets reduced due to presence of the impurities in the material. Also the design parameters, operating mode, working temperature, shot penning, surface imperfection within spring had direct impact on the fatigue strength of the spring. With increase in the temperature, the tensional yield strength and modulus of the spring decreases. The shot penning on internal side of the spring surface increases the fatigue strength of the spring. [2]

**Hardik J. Patel** According to literature review, the thread cutting or tapping operation is done for the last stage of the manufacturing. When the fastening is an important for further stage, the tapping is done to fasten the jobs to each other. There are many aspects in the internal threading by which the threading can be judged, that includes accuracy of hole, quality of tapped hole, proper alignment with tapping tool, various lubricants and its properties, vibration assisted tapping, machine tapping. These parameters affect the tool life while hand tapping and machine tapping. To study the tool breakage, these parameters are largely affecting. [3]

**Salunke Mahesh** According to author, if the human work is replaced by the automatic machine then the productivity is increased and the cost of labor is also saved. The machine working is more reliable than the human working. As jerks produced are in lower values in case of the machine working and more in case of the machine working. Author made the automation in thread producing machine to replace the hand or manual threading by machine. Author concluded that the automation by replacing the manual by automatic machine increases the accuracy and productivity. [4]

**Internal thread cutting assembly**

The small thread cutting attachment is designed for cutting small right hand internal and external thread. The attachment is mounted in a place of standard tail stock. It has maximum threading capacity up to M4 diameter. Maximum threading length for external is 10 mm and internal is 6 mm. It consists of quill including the threading spindle and a motor Mount on the quill the Motor drive the cutting spindle by means of two step v belt transmissions the threading cutting spindle is provided with a double cone clutch. During the thread cutting operation the clutch disc of the spindle is pressed against the rear stationery clutch. disc and thread there by lock after the required thread length has been reached the tailstock is return and the clutch disc of the spindle is this against the v belt pulley the spindle rotates at a faster speed and the thread cutting tool runs of the thread

the attach and return cams on the drilling camp drum must be made to correspond exactly with the thread pitch and the revolution of the main spindle and thread cutting spindle. Spindle for attachment is where the threading tool is mounted. And the cutting tool is the main and important part of the attachment; hence the spindle plays an important role in the attachment. Torsion Moment =  $T = \frac{\tau \times J}{R}$

$$= \frac{529.5 \times \frac{\pi}{32} \times 13^4}{\frac{13}{2}}$$

$$= 255592.61 \text{ N.mm}$$

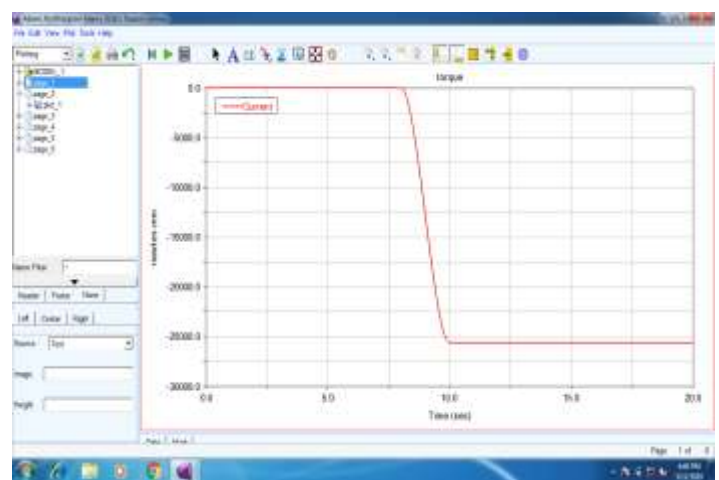


fig.2 Torque analysis of spindle using MSC-ADAMS softwere(student edition)

In post processor the torque can be calculated which is acting on a spindle. The curve is plotted in a post processor in which gives the value of torque at any time and any position of the spindle. The maximum value of torque and minimum value of torque can be found on a graph. Due to time and torque value known the maximum torque acting on spindle the position of spindle can be calculated or founded. during the time period of 6 sec. to 10 sec. the torque is increases and after the 10sec. torque acting on spindle is constant. Spindle deformation is very negligible hence it is not bothered about the deformation. The deformation is seen from the MSC-ADAMS software (student edition). Material is selected 16MnCr5 from manufacturer’s catalogue in order to withstand the up to 10N force on the spindle while thread cutting action as measured in actual practice in industry.

