

INTRODUCTION to Axial Thread Rolling

Description

The thread rolling process is now widely acknowledged as the fastest and most efficient method of producing accurate external threads, with surface finish and mechanical properties unobtainable by any other method.

This simple cold forming operation enables engineers to produce threaded fasteners and components to the most exacting standards with ease and repeatability on a wide range of materials. In fact, many high tensile and safety critical components, such as used in the aerospace industries, demand a rolled thread for its high strength properties and no other threading method will be accepted in these cases.

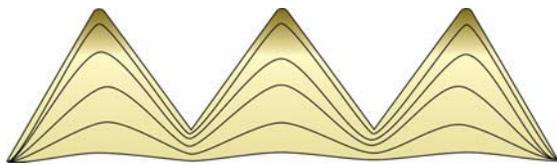


Figure 1: Grain structure of rolled thread

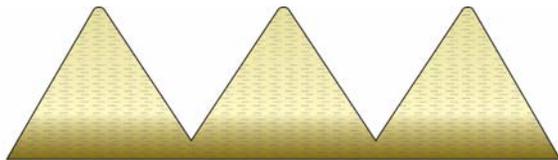


Figure 2: Grain structure of cut thread

The properties of a rolled thread are best illustrated by examining the cross section of a thread that has been produced by thread rolling and comparing it to a thread that has been produced by conventional cutting.

The rolled thread form does not break through the grain of the material as occurs with a cut thread and is subsequently more resistant to fracture during tensile loading. The compressive action that takes place during thread rolling serves to increase the hardness of the material, improve its tensile and yield strengths due to the burnishing action of rolling. As a result, thread rolling gives a highly polished finish that resists surface corrosion.

Axial Thread Rolling

The thread rolling heads detailed on pages 34 - 47 of this catalog all function by means of axial or end feeding. This process requires the head to be applied to the end of a prepared blank at a controlled feed rate so that the lead on the thread rolls engage with the lead chamfer on the blank. Once the rolls have engaged with the blank the head will feed itself axially along the part until it reaches the end of its stroke. At this point the forward motion of the head is arrested and the pull off mechanism operates to open the head so that the rolls clear the thread and the head can then be retracted from the part. Due to the self feeding action of the head, it is equally suited to machines without a feed control mechanism as well as machines with lead screws or CNC controlled slides.

On manual type machines the head is reset by the operator before each threading pass using the standard handle equipped with the head. The same method is used when the head is mounted into the turret of a CNC chucking lathe. When operated under automatic cycle on either cam or CNC bar autos, the manual ball type handle is replaced by a closing pin which has to be actuated by an external closing lever or strike plate mounted at the indexing position of the machine turret (the same principle as a conventional diehead). Some machine tool manufacturers offer separate pneumatic actuating units which are ideally suited to closing thread rolling heads.

