Milling machine

Milling: is a metal cutting operation in which the excess material from the work piece is removed by rotating multipoint cutting tool called milling cutter.

A **milling machine** is a machine tool that removes metal as the work is fed against a rotating multipoint cutter. The milling cutter rotates at high speed and it removes metal at a very fast rate with the help of multiple cutting edges.

One or more number of cutters can be mounted simultaneously on the milling machine. This is the reason that a milling machine finds wide application in production work.

Used for machining flat surfaces, contoured surfaces, external and internal threads.

Milling machine

- As the workpiece moves against the cutting edges o milling cutter, metal is removed in form chips
- Machined surface is formed in one or more passes of the work.
- The work to be machined is held in a vice, a rotary table, a three jaw chuck, an index head, in a special fixture or bolted to machine table.
- In many applications, due to its higher production rate and accuracy, milling machine has even replaced shapers and slotters.

MILLING METHODS

Two basic methods of milling

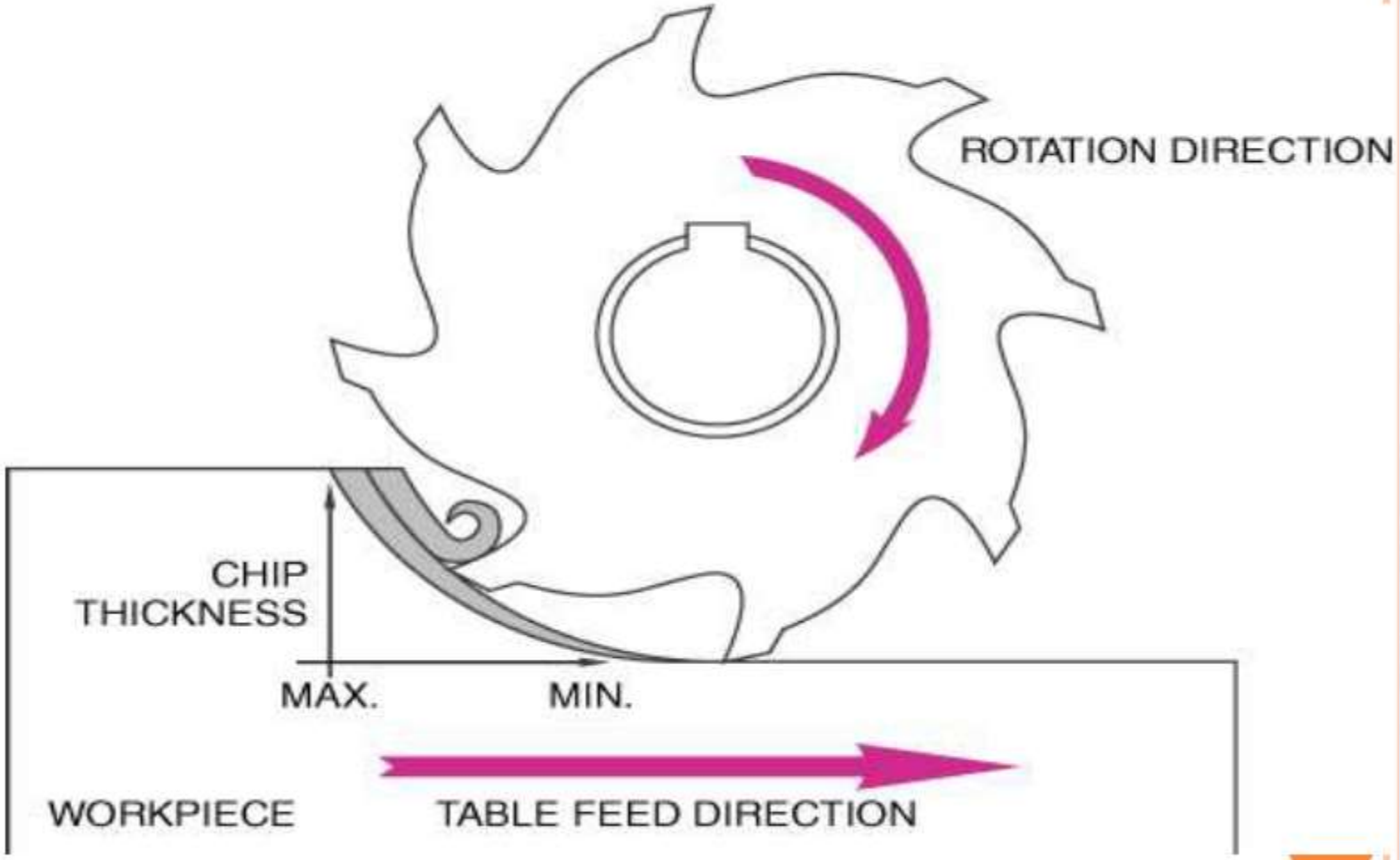
1.Up-milling or conventional milling

2.Down-milling or climb milling

1.Up-milling or conventional milling

- Metal is removed by cutter rotating against the direction of travel of the workpiece.
- Needs stronger holding of the job.
- Chip thickness is minimum at the start of cut and maximum at the end of the cut.
- Disadvantage- tendency to lift work from the fixtures and poor surface finish.

1. Conventional Milling

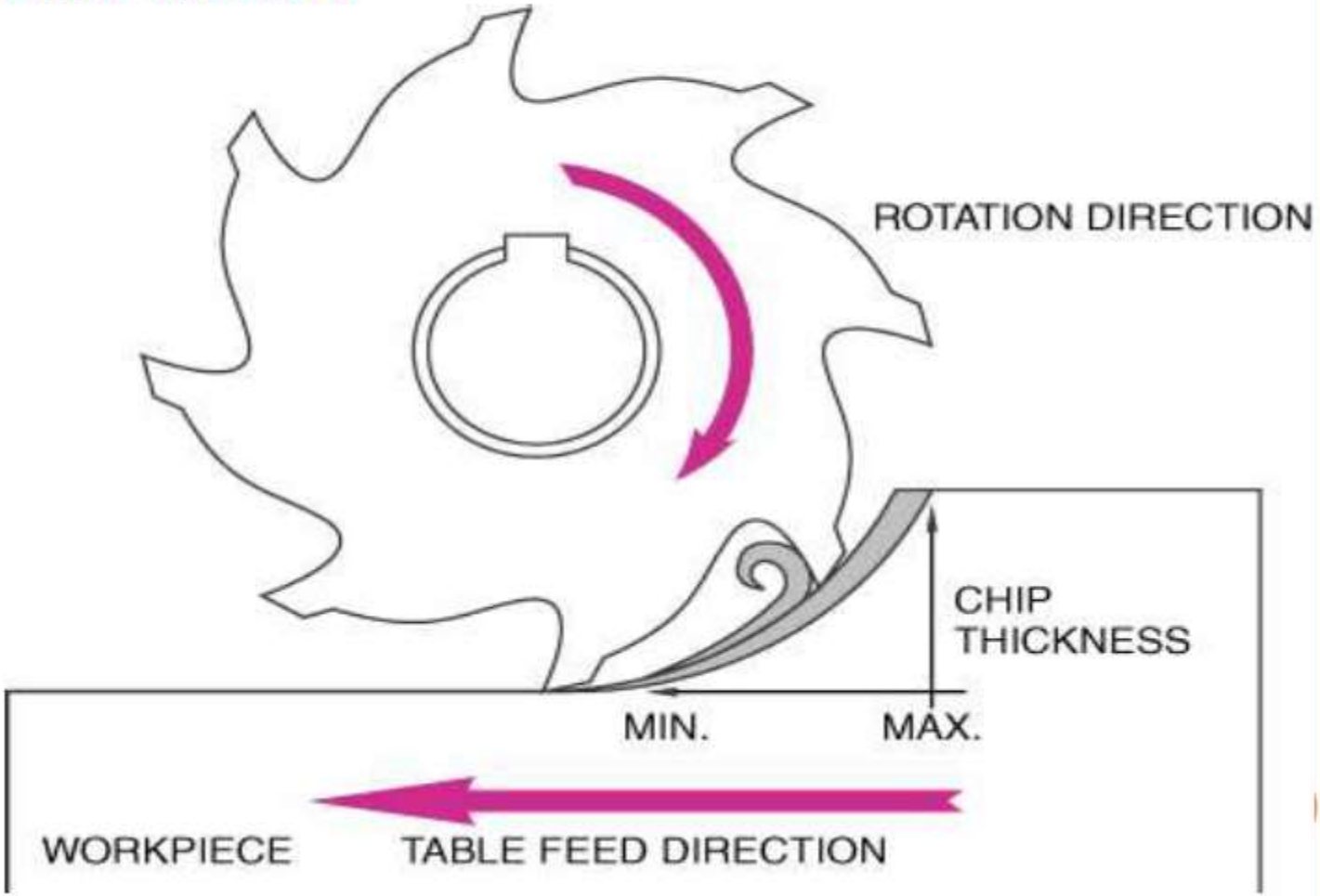


MILLING METHODS

2.down-milling or climb milling

- Metal is removed by cutter rotating in the same direction of travel of the workpiece.
- teeth cut downward instead of upwards.
- Chip thickness is maximum at the start of cut and minimum at the end of cut.
- Less friction involved
- Better surface finish.
- Less power consumption.

2. CLIMB MILLING



PRINCIPLE OF MILLING