

【Question】

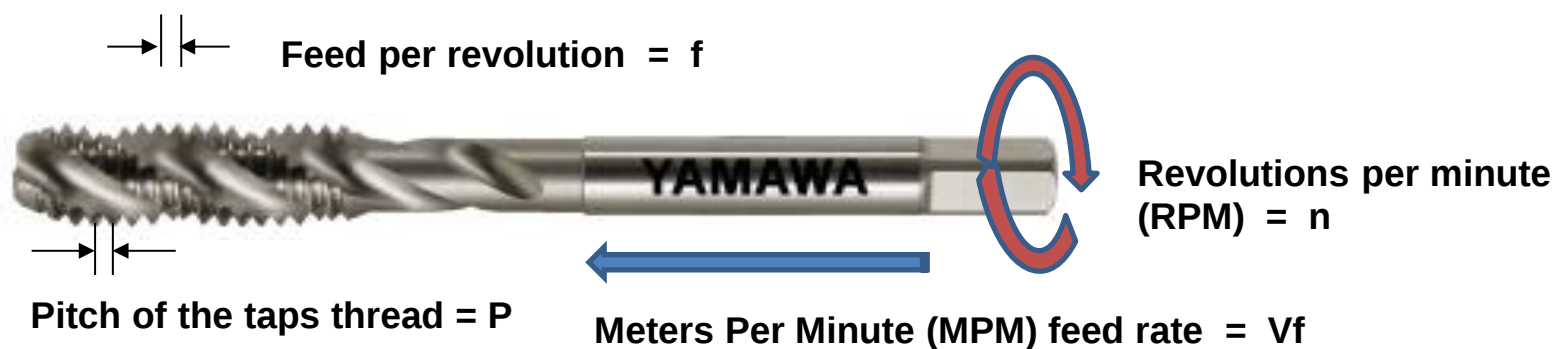


How can I calculate the feed rate of a machine using the following tap?

- Spiral fluted tap M12 X 1.75
- Using the recommended cutting speed of 7m/min (23 SFM).

【Answer】

It's easy if you know the thread pitch (P) and the recommended Revolutions Per Minute (RPM).



$$V_f = n \times f$$

V_f : Feed rate of the machine in MPM

n : Revolutions per minute (RPM)

f : Feed per revolution in mm

P = Pitch of the thread in mm

Using the example of 186 revolutions per minute (RPM) we can calculate the Meters Per Minute (MPM) of feed rate of the machine. (see YES-008 for details)

Tap: M12 X 1.75

Cutting speed: 7m/min

The feed per revolution (f) is the same as the pitch of the taps thread on a single start thread. On a double start thread the feed per revolution is 2 times the thread pitch. On a 3 start thread the feed is 3 times the thread pitch and so on.

Example: the machine feed rate (V_f) of a single start M12 X 1.75 thread ran at 186 revolutions per minute (RPM) is calculated as follows;

$V_f = 186 \text{ RPM} \times 1.75 \text{ mm Thread Pitch} = 325.5 \text{ mm per minute feed rate millimeters per minute (mmpm)}.$

$325.5 \div 1,000 = .325$ feed rate in Meters Per Minute (MPM).



When calculating a metric screw thread, the thread pitch measurement is taken from a point of the thread to the same point of the next adjacent thread.

When calculating Unified inch screw threads, Whitworth screw threads or pipe threads the measurement of the thread pitch is measured by dividing 1.000" by the threads per inch (TPI). This calculation will yield the distance from a point on a thread to the same point on the next adjacent thread in inches.

Example: 1/2"-13UNC Pitch size = $1.000" \div 13 \text{ TPI (P)} = 0.0769"$ or 1.954mm.

Diameter conversion = $1/2" \div 25.4 \text{ mm/inch} = 12.7 \text{ mm}$ Diameter

Recommended cutting speed in meters per minute (Vc) = 7 m/min

Machine spindle speed in RPM (n) = $(1000 \times 7 \text{ MPM}) \div (3.14 \times 12.7 \text{ mm}) = 175 \text{ revolutions per minute (RPM)}$

The feed rate of the machine for a 1/2"-13 TPI tap = $1.954 \text{ mm} \times 175 \text{ RPM} = 341.95 \text{ mm per minute} = .342 \text{ Meters Per Minute feed rate.}$

