No. 008

How to use Yamawa's cutting speed recommendations for taps

How to use

【Question】

How can I calculate the revolutions per minute (RPM) of a tap if I know the recommended cutting speed?

-Spiral fluted tap M12 X 1.75

-I'm using the recommended cutting speed of

7m/min or 23 SFM.

【Answer】

All cutting speed recommendations are given in Meters Per Minute (MPM) or Surface Feet Per Minute. Taps vary in diameter depending on the thread size, so they produce a different MPM when ran at the same RPM.

When using the recommended MPM of the tap, the recommendation must be converted to RPM so different diameter taps can be ran at the same MPM.

The calculation for Revolutions Per Minute (RPM) requires the measurement of the circumference of a circle.

As you can see, it is easy to measure a straight line with a scale or ruler but measuring the circumference of a circle seems overwhelming at times.

This is also easily done by multiplying the diameter of the circle by π (Pi) or the constant 3.14 to determine the distance around the circle.

You can calculate revolutions per minute (RPM) from the recommended MPM by using a simple formula.

YES-008

Bag full of wisdom when you are in trouble

How to use

<Calculate "n" when "Vc" is given>

$$n = \frac{1{,}000 * Vc}{\pi * Dc}$$

Vc: Tapping speed (meters per min.)

Dc: Outer diameter of the tap (mm)

π : 3.14

n : Revolutions per minute (RPM)

To calculate the Revolutions Per Minute (RPM) of the M12 X 1.75 spiral fluted tap above with a speed recommendation of 7 meters per minute use the following:

(1000 X 7m/min) ÷ (3.14 X 12mm) = 7000 ÷37.68 =185.77 RPM

The ideal revolutions per minute (RPM) for the machinery with a M12 tap at 7 meters per minute is 186 RPM.

<Calculate "Vc" when "n" is given>

$$Vc = \frac{\pi * Dc * n}{1{,}000} \div m/mm$$

Vc: Tapping speed (meters per min.)

Dc: Outer diameter of the tap (mm)

π : 3.14

n : Revolutions per minute (RPM)

How to calculate tapping speed Vc (m/min) using the same information shown above:

The tapping speed of a M12 X 1.75 spiral flute tap at 186 RPM's is:

(3.14 X 12 mm X 186 RPM) ÷(1000) = 7.008 MPM (Meters Per Minute).

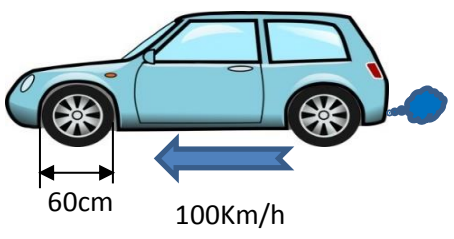
You will need the following information to calculate the conversion of cutting speed MPM to RPM. You will need the same information to convert RPM to MPM.

Dc (Outer diameter of the tap): Shown in mm.

Vc (tapping speed) : In Meters Per Minute (MPM).

1m = 1000 mm.

m/min: Meter Per Minutes.



Take this challenge to see what you've learned.

Use the following to calculate the RPM of an automobile tire;

Diameter of car tire: 60 cm

Driving speed: 100 km/h

Dc = 60 cm = 600 mm

Vc = 100km = 100,000m

Time 1 hour = 60 minutes

$$\frac{\text{1,000 X 100,000m}}{\text{3.14 X 600 mm}} \div 60 \text{ minutes} = 884 \text{ RPM}$$

Remember this?

$$Vc = \frac{1{,}000 * Vc}{\pi * Dc} \div m/mm$$