

160 linear feet per second: $RPM = 37,000/D$

This could help you to get very much the same “cut” with two very different router bits.

Maximum RPM

Maximum RPM often listed on saw blades refers to the maximum safe rotational speed for a given blade – not optimum cutting speeds. Spinning faster than the Maximum RPM could cause the teeth to fly right off of the blade or the blade to fracture with a shock.

Working with pulleys

If you are working with pulleys between the motor and the blade, here is a great chart from Diamond Pacific Corporation to help figure out pulley ratios.

Blade Size

Follow this link for an explanation as to why there are so many different sized circular saw blades.

The Algebra

For those who want the Algebra to get from “blade diameter in inches” and “blade rotation in rpm” to tooth linear movement in Feet/Second:

$\pi * \text{Dia} = \text{circumference}/12$ gives the number of feet a tooth travels in one rotation

So $3.1416 * \text{Dia}(\text{inches})/12 \text{ inches} = \text{feet per rotation}$

RPM is $\text{Rev}/\text{min} / 60 = \text{rev}/\text{sec}$ or RPS

“Feet per rotation” times RPS = linear tooth speed in “feet per second”

$D = \text{Diameter in inches}$ $RPM = \text{rotational speed of blade}$ $F/S = \text{linear speed of tooth}$

$$(3.1416 * D/12)(RPM/60) = F/S$$

and ideally F/S is between 130 and 170 Feet/Second for woodworking

Now you see that algebra course is still useful long after you left school.

Keywords:

Woodworking, Workshop, Saws, Blades, Cutting, Power Tools, Router, Techniques, Tools, Video - Included

Article 2226

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