

# LATHE SPEED SAFETY

Wood Diameter Inches	Maximum Starting RPM	Maximum RPM
2	3,000	4,500
4	1,500	2,250
6	1,000	1,500
8	750	1,125
10	600	900
12	500	750
14	429	643
16	375	562
18	333	500
20	300	450

Revolutions per Minute	2 Inch Diameter Miles/Hr.	6 Inch Diameter Miles/Hr.	12 Inch Diameter Miles/Hr.	18 Inch Diameter Miles/Hr.
250	14.9	44.6	89.3	133.9
500	29.7	89.3	178.5	267.8
1,000	59.5	178.5	357.0	535.5
1,500	89.3	267.8	535.5	803.3
2,000	119.0	357.0	714.0	
2,500	148.8	446.3		
3,000	178.5	535.5		
3,500	208.3			
4,000	238.0	714.0		
4,500	267.8			

The smaller spreadsheet is an expansion of the Woodturning Safety 101 guidelines in the Craft Supplies USA catalog which recommends using the formula: Diameter x RPM = 6,000 - 9,000 and the example of an 8" diameter bowl blank.

$$8" \times 750 \text{ RPM} = 6,000$$

$$8" \times 1125 \text{ RPM} = 9,000$$

Therefore the slowest recommended spindle speed is 750 rpm with the highest recommended speed being 1125 rpm. I think the projected starting rpm speeds may be faster than safe or necessary and the calculated speeds for larger diameter bowls may be a bit conservative.

Lathe speed is influenced by:

- Wood size and shape
- How wood is held on the lathe (tail stock engaged, faceplate, woodworm screw, chuck with dovetail compression jaws, chuck with other jaws, pin center drive)
- Lathe size/weight/stability
- Tool sharpness (must be sharper at slower speed; faster = cleaner cut)
- Woodturner experience and skill

General guidelines

- Always confirm desired speed setting before turning lathe on
- Start slow, especially with unbalanced out-of-round wood
- Increase speed cautiously once wood is round
- Decrease speed if lathe vibrates
- Avoid unstable wood with cracks, loose bark

--Don Voas, March 7, 2015