

The BLADE MFG. CO.

915-A Distribution Drive – Columbus, OH 43228
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Cold Saw Tooth Recommendations

Tooth Count Selector - Value in each cell is the tooth pitch. Use the the tooth pitch calculator under the chart to determine the tooth count for your blade diameter

TUBE & PIPE

Tube Diameter	Wall Thickness							
	.049"	.062"	.083"	.109"	.125"	.140"	.187"	.250"
1/2"	3	3	4	4	5	5	-	-
5/8"	3	4	4	5	5	5	-	-
3/4"	3	4	4	4.5	5	5	6	
1"	3.5	4	4	4.5	5	5	5.5	7
1-1/4"	3.5	4	4.5	5	5	5.5	6	7
1-1/2"	3.5	4	4.5	5	5	5.5	6.5	7.5
1-3/4"	4	4	4.5	5	5.5	5.5	6.5	7.5
2"	4	4	4.5	5	5.5	6	7	8
2-1/4"	4	4	4.5	5	5.5	6	7	8
2-1/2"	4	4.5	5	5.5	6	6	7	8
2-3/4"	4	4.5	5	5.5	6	6	7	8
3"	4	4.5	5	5.5	6	6.5	7.5	8.5
3-1/4"	-	4.5	5	5.5	6	6.5	7.5	8.5
3-1/2"	-	4.5	5	6		6.5	7.5	9
3-3/4"	-	4.5	5	6	6.5	6.5	7.5	9
4"	-	4.5	5	6	6.5	6.5	8	9

Increase pitch by 1 for square tubing

Increase tooth count by 20% for stainless steel and hard alloy steel

Tooth Count = (Diameter mm x 3.1416) ÷ Tooth Pitch or Circumference ÷ Tooth Pitch

Example: (350mm x 3.1416) ÷ 6 Pitch =180 Teeth

SOLID BAR Bar Diameter	Tooth Pitch		
	Mild Steel	Tough Alloy & Stainless	Aluminum & Copper
1/2"	4.5	4	6
5/8"	6	5	7
3/4"	6.5	5	7.5
1"	7	6	8
1-1/4"	7	6.5	9
1-1/2"	8	7.5	10
1-3/4"	8.5	8	11
2"	9	8.5	11
2-1/4"	10	9.5	12
2-1/2"	11	10.5	13
3"	12	11.5	14
3-1/2"	13	13	16
4"	14	14	18

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Cold Saw Cutting Speed and Feed Recommendations M2 HSS/DMo5 and M35 Co5 (5% Cobalt)63/65 HRc

<u>Material to be Cut</u>	<u>Cutting Speed mt/min</u>	<u>Feed Rate/Chip Load as mm/Z</u>
Low Alloy Steel	50-80	.04 - .08
Medium Hard Alloy Steel	40-50	.03-.07
Hard Steel	20-30	.02-.06
Stainless Steel	20-30	.02-.06
Cast Iron	25-35	.03-.05
Inconel	15-25	.02-.05
Titanium	15-25	.02-.05
Copper	300-500	.04-.06
Bronze	300-500	.05-.07
Brass	400-600	.05-.07
Aluminum	500-700	.06-.08

RPM= $\frac{\text{Mt. per Min.} \times 10000}{\text{Blade Diam.} \times 3.1416}$

Example: $\frac{30 \times 1000}{350 \times 3.1416}$

$30,000 \div 1,100 = 27 \text{ RPM}$

<u>Material to be Cut</u>	<u>Cutting Speed in SFPM*</u>	<u>Feed Rate/Chip Load (inch per tooth)</u>
Low Alloy Steel	165-260	.0016" - .003"
Medium Hard Alloy Steel	140-165	.001" - .0027"
Hard Steel	65-100	.0007" - .0023"
Stainless Steel	65-100	.0007" - .0023"
Cast Iron	80-115	.001" - .002"
Inconel	5080	.0007"-.002"
Titanium	50-80	.0007" - .002"
Copper	980-1640	.0016" - .0023"
Bronze	980-1640	.002" - .0027"
Brass	1300-1950	.002" - .027"
Aluminum	1600-2250	.002" - .003"

RPM = SFPM x 3.82 ÷ Diam"

Convert mm to Inches: mm ÷ 25.4 Example: 350mm ÷ 25.4 = 13.78"

Convert Inches to mm's: Inches X 25.4 Example: 14" x 25.4 = 355.6mm

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Cold Sawing Tips

- The tooth count selection is very important for optimal blade performance. The tooth pitch is measure as the distance from tooth tip to tooth tip. There should be 3-6 teeth in the cut depending on the material being cut. A blade may need re-toothed after the blade is sharpened several times to maintain the tooth pitch.
- The tooth geometry, hook angle and top clearance angle, can vary depending on the material being cut. Stainless steel is the most critical material for selecting the proper tooth geometry.
- The recommended RPM is determined by the blade's rim speed which is measured by feet or meters per minute (ft/min or m/min). The diameter of the blade combined with the rim speed results in the recommended RPM. The recommended rim speed/RPM can vary depending on the material being cut. The recommended rim speed for mild low alloy steel is 165-260 ft/minute so a 350mm blade cutting mild steel should run 45 to 70 RPM. It's always best to start slow and gradually increase speed and feed.
- Feed is commonly referring to the chip load. The chip load is the amount of material each tooth is removing per revolution. The max chip load should not exceed 0.1mm or .004". The chip load is used to determine the feed in inches per minute.
- The shape and color of the chip is sign of the correct feed. Chips should be bright, curled/ rounded and the consistent in size.
- Flood coolant is recommended for cold sawing with the correct coolant mixture. Mist can also be used but may not be as effective as flood coolant.
- If the material is galling to the blade, it could be a sign of insufficient coolant and excessive heat.
- If material is building up in the teeth the blade may need re-toothed
- Always make sure your blade is clean and free of debris prior to use. Make sure the mounting flanges and collars are clean and free from debris.
- When mounting the blade, it is important to remove the backlash by rotating the blade in the opposite direction of the blade rotation prior to tightening the blade so the pins are resting on the rotational side of the pinholes.
- It's a good idea to break a new blade or resharpened blade in by making 5 to 10 cuts at 25% of the normal feed rate.
- Cold sawblades should be sharpened on CNC cold saw grinders with premium CBN wheels and high-pressure coolant. We have several of these machines.