

How-To's

for all Band Saw Blades

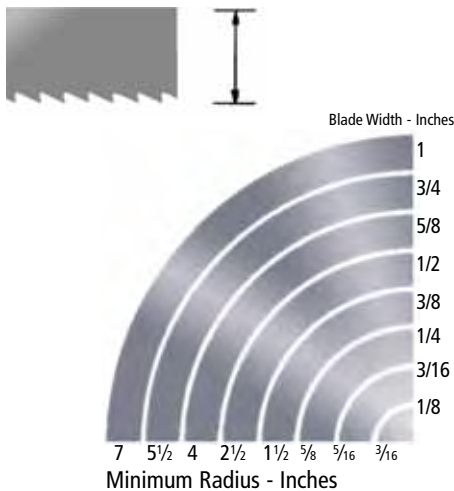
Choose the Correct Blade Width

If no such instructions are provided, blade width should be determined with the following guidelines:

For Cut-Off Sawing the blade should be as wide as the machine will allow. The wider the band is, the straighter the cut will be and faster feeding can be achieved.

For Contour Sawing the blade should be as wide as the machine allows, but still narrow enough so that it can cut the desired shape (radius). Minimum dimensions for different cutting radii are shown on the chart below.

Blade width is measured from the tips of the teeth to the back edge of the blade as shown at right. The instructions for the particular machine being used should be followed when selecting blade width.



Glossary of Band Saw Blade Terminology

Blade Tension – the direct pull (in pounds) on the blade.

Beam Strength – resistance a saw blade has to back deflection when subjected to the edge thrust of feed pressure.

Camber – an arcing or bending of the back or cutting edge of the saw blade. In positive camber the cutting edge arcs backward; in negative camber the cutting edge arcs forward.

Carbon Steel – the result of carbon being added to iron in the making of steel.

Chatter – rumbling sound in the machine caused by trying to take too heavy a cut. The sound comes from overloading the machine.

Chip – a small fragment of material removed by each tooth on the cutting edge.

Chip Clearance – the gullet area between two teeth.

Cutting Rate – the speed at which the cross sectional area of the workpiece is cut, expressed in square inches of cutting per minute.

E.T.S. (Every Tooth Set) – each tooth is alternately set left then right, used generally in woodworking and for non-ferrous metals. Also known as alternate set. Spring Steel blades only.

Feed – pressure exerted by the workpiece against the cutting edge of a saw blade expressed in pounds.

Feed Rate – linear travel of the workpiece into the blade, usually expressed in inches per minute.

Tooth Style and Set

Regular Tooth The most commonly used tooth shape. Ideally suited for both cut-off and contour sawing of most materials. For cutting thin materials where a fine cut is needed.



Skip Tooth Widely spaced teeth with a 0° rake angle to prevent clogging when cutting soft, non-ferrous metals, plastics and wood.



Hook Tooth Positive 10° rake angle helps to "dig-in", resulting in a higher cutting rate. Recommended for long cuts into thicker wood, plastic and metal.



Raker Set tooth consists of one to the left, one to the right and one tooth (raker) is unset. It is used for cutting thick, solid metal sections on horizontal cut-off machines. Also for contour cutting and resawing on vertical band machines.

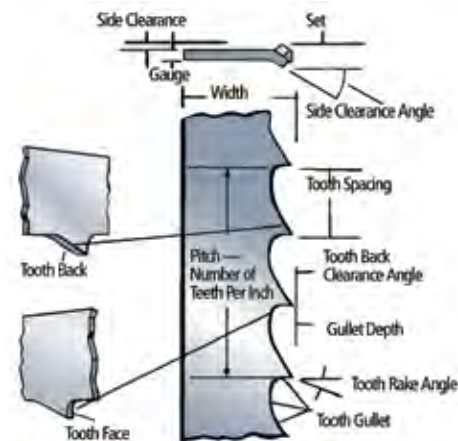
Modified Raker Set tooth pattern is left, right, left, right, and straight (unset or raker). Excellent choice for cutting wood on any 2-wheel vertical stationary band saw. Not available for every tooth and blade type.



Alternate Set or double alternate plus raker set blades are for faster, smoother cuts in wood.



Wavy Set pattern has groups of teeth set to the left and to the right, separated by unset raker teeth. It is made primarily with small teeth and is recommended for cutting thinner sections—tubes, pipes, thin sheets and other small shapes.



Flex Back – saw blade with hardened teeth but a relatively soft back.

Gullet – space within the curved area between two saw blade teeth.

Hard Back – a type of high carbon, spring tempered back, saw blade.

Hook Tooth – a tooth form with a shallow gullet and widely spaced teeth and a positive rake angle.

Kerf – slot made by a cutting tool in parting material.

Pitch – the number of teeth per inch in a saw blade.

Points – tips of teeth in a saw blade.

Rake Angle – angle the tooth face makes with respect to a perpendicular line from the back edge

Teeth Per Inch (TPI)

The number of teeth per inch (TPI) is important for getting the finish desired and the proper feed rate. A coarse tooth blade (2, 3 TPI) should be used for resawing wood and cutting thicker stock up to 8". A fine toothed blade (18 to 32 TPI) should be used for thinner metals and plastics under 1/4". For general cutting of 3/4" wood 4 TPI will provide a fast cut and 14 TPI will cut slow but leave a smoother finish.

When Selecting TPI remember:

- More TPI give a smoother but slower cut
- Fewer TPI allow a faster cut with a slightly rougher finish
- At least three teeth must be in the workpiece—the chart above will help you decide.

It is important to know the SFM for the various speed settings of your band saw, so that you can select the proper speed for cutting wood or other materials. Check the operator's manual of your band saw to determine the SFM or use the following procedure:

1. Determine the RPM: check the operator's manual or clock the revolutions per minute of the wheels with a tachometer or revolution counter.
2. Measure the diameter of the drive wheel in inches and multiply by π to find the wheel circumference. $RPM \times \text{circumference} = \text{surface speed of the blade.}$

RPM x diameter in inches x .262 = SFM

Note: Olson Spring Steel Wood Cutting Band Saw Blades should never be operated at surface speeds above 3000 SFM. Olson Carbon Hard Edge Flexible Back Band Saw Blades may be run up to 8000 SFM.

of the blade. It is positive when the tooth angles forward in the direction of the cutting action and negative when it angles backward from the direction of the cutting action.

Raker Set – a saw tooth pattern in which one tooth is set right, the next to the left and the third is straight.

Regular Tooth (Conventional tooth) – a tooth form with a deep gullet with a smooth radius at the bottom.

Set – bending of teeth in a saw blade to the left and/or right of center. The setting of teeth enables a saw blade to cut straighter, to clear the chips from the kerf, and to allow the back of the band to clear the cut and not bind.

Side Clearance – the difference in dimension between the set of the teeth and the back of the blade. It provides space for maneuvering the band in contour cuts, prevents lead when making straight cuts and minimizes transfer of frictional heat to the work.

Skip Tooth – a tooth form consisting of a shallow gullet with widely spaced teeth to provide for ample chip clearance. 0° rake angle.

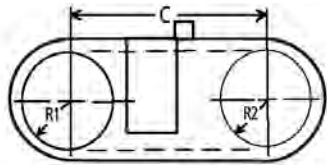
Strippage – when one or more teeth are pulled or break out of a saw blade.

Twist – tendency of a saw blade to spiral after use.

Wavy Set – A saw tooth pattern having one group of teeth set to the right and the next group set to the left to give the appearance of a wave viewed from the top of the blade.

Choosing the Correct Blade Length

If the Operator's Manual for your band saw does not specify the proper blade length, use the following procedure to determine the blade length:



1. Fix pulleys or wheels in working position.
2. Determine distance from center of hub on upper and lower wheels (C).
3. Determine radius of the upper and of the lower wheel.
4. Apply the following formula:
$$(R1 \times 3.1416) + (R2 \times 3.1416) + (2 \times C) = \text{length.}$$

Diagnosing Problems

1. Premature and Excessive Tooth Wear

- Feed pressure too light, increase it.
- Lower band velocity.
- Improper tooth selection, use a finer pitch.
- Improper break-in with new band. Velocity and feeding should be reduced the first few cuts.
- Teeth are running the wrong direction. Be sure teeth are pointing in proper direction.
- Incorrect saw guide insert size for the band, allowing them to strike teeth



2. Blade Vibration

- Increase or decrease band velocity.
- Increase tension of band.
- Teeth too coarse for workpiece.
- Increase feed pressure.
- Material not securely held.

3. Gullets Loading

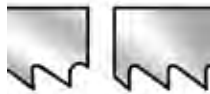
- Teeth too fine for workpiece - use a coarser pitch.
- Decrease band velocity.

4. Band Stalls in Work

- Feed pressure too great - decrease feed.
- Teeth too coarse, use finer tooth blade.

5. Premature Blade Breakage

- Thickness of blade too heavy for diameter of wheels and speed of machine.
- Increase or decrease velocity.
- Check wheels for defects.
- Teeth too coarse for workpiece - use a finer pitch.
- Decrease blade tension.
- Decrease feeding force.
- Brittle weld - increase annealing period, decreasing heat gradually.
- Check for proper adjustment of band guides, saw guides, saw guide inserts and back-up bearings.



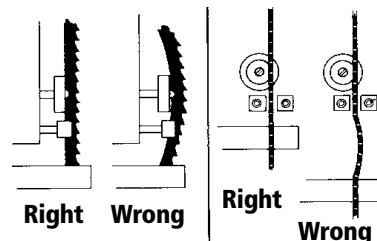
Installing your Band Saw Blade

1. Unplug the saw, then loosen the tension on the upper wheel. With all the blade guides backed off, slip the new blade around the wheels and then tension it.
2. When you have tensioned the blade enough to keep it on the wheels, track it by turning the upper wheel with one hand while adjusting the tilt of the wheel's axis with the other hand. The blade should ride in the middle of the rim.

Never track the blade with the motor running and the cover open.

3. Next, adjust the blade guides; first the thrust bearings: upper and lower, then the left hand side guides.

4. Use a square to make sure you are not pushing the blade out of line and place a piece of white paper between the blade guide and the blade to allow for clearance.



6. Blade Making Belly-Shaped Cuts

- Increase tension.
- Adjust guides closer to workpiece.
- Teeth too fine - use a coarse pitch.
- Decrease feed force.
- Teeth dull.



7. Tooth Stripping

- Teeth too coarse for workpiece.
- Material not securely held.
- Too much feed pressure - reduce for good chip curl.
- Band velocity too low - increase speed.



8. Band Develops a Negative Camber

- Band is riding on saw guide backup bearing too heavily. Adjust band for alignment on top and bottom wheels.
- Check band wheel alignment.



9. Blade Not Running True Against Saw Guide Backup Bearing

- If clicking noise against saw guide backup bearing, remove burr on band.
- Check band wheel alignment.
- Check saw guide backup bearing for wear, replace if necessary.
- Weld not in proper alignment. Reweld blade straight and true.

10. Cutting Rate Too Slow

- Increase band velocity.
- Increase feed pressure.
- Use a coarser pitch.

11. Blade Leading In Cut

- Reduce feed pressure or rate.
- Check adjustments and wear of saw guides or rollers.
- Lack of band tension.
- Tooth set damage.



12. Premature Loss of Set

- Improper width selection - check chart for correct width for radius cutting.
- Reduce band velocity.

13. Band Develops Positive Camber

- Decrease force.
- Use a coarser pitch to increase tooth penetration.
- Adjust saw guides closer to work.



14. Band Develops Twist

- Wrong width for radius being cut - choose a narrower blade.
- Binding in cut - decrease feed pressure.
- Decrease band tension.
- Adjust saw guides further from workpiece.



15. Finished Cut Surface Too Rough

- Improper tooth selection - choose a finer pitch.
- Increase band velocity.
- Decrease feed rate.



16. Band Scoring (side wear or grooving)

- Check for wear on saw guide inserts.
- Too much pressure on saw guide inserts.
- Check alignment of saw guides - be sure they are square to front vise. Replace or clean guides.



17. Burring or Mushrooming of Blade Back Edge

- Increase tension and adjust guides.
- Check contact between blade and back edge rollers.
- Reduce feed pressure.
- Use coarser pitch blade.
- Use finishing stone.

