Wood-Mizer® Thin-Kerf Blades

Blade Handbook

A Guide To Understanding Bandsaw Blade Terminology

Safety is our #1 concern! Read and understand all safety information and instructions before operating, setting up or maintaining this machine.

Form #600

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SECTION 1 BLADE INTRODUCTION

Wood-Mizer is the worldwide leader in portable bandmills and other wood-processing equipment. Wood-Mizer is also the only sawmill manufacturer that produces narrow-band thin-kerf blades. When we introduced our first portable bandmill in 1982, one thing quickly became clear: We needed better blades than were currently available.

After evaluating the materials and processes others were using to make blades, Wood-Mizer decided the only option was to manufacture its own blades. This decision has led to advancements in blade materials and processing that have revolutionized the industry. Advances in developing bigger and better sawmills, combined with our countless hours and dollars spent on blade technology have resulted in customers being able to saw more lumber faster using less horsepower than traditional sawmills.

The blade can cause the success or failure of a cutting operation. It is important for sawyers to understand definitions and theories about blades. What our research has shown to be the most productive has not always matched what the textbooks say. We believe this is due to the low horsepower and narrow width of our blades as compared to larger production mills. This section explains narrow-band blades used with the Wood-Mizer®.

Wood-Mizer® blades are available in various widths, thicknesses and tooth profiles to satisfy any cutting application. The following chapters provide information that will help you determine which blade to use. A Customer Service Representative can also help you decide which blade is best for your cutting application (1-800-525-8100). You can also call Wood-Mizer Blades at 1-800-522-5760 and speak with a blade consultant or visit our website at *www.woodmizerblades.com*.

Blade Performance Issues. Please remember that Wood-Mizer's policy is to not warrant that the blade will perform to every customer's expectations in every possible cutting situation. This policy is necessary because of the numerous issues outside our control that could negatively impact the blade's performance. However, blade performance issues that can be verified by the Blade Department will be considered for warranty reimbursement.

1.1 Best Blade In The Industry

Wood-Mizer® is the only sawmill manufacturer that makes its own blades.

Wood-Mizer® builds quality into every blade we manufacture. From the selection of the raw materials to the output of the final product, every step of the manufacturing process is controlled and inspected. Over one hundred separate tests and inspections ensure the quality of every blade that comes to you in a Wood-Mizer® box of blades.

Each Wood-Mizer® blade tooth is individually measured and set by computer-controlled equipment during the manufacturing process.

Wood-Mizer® is the only company that stamps an identification number onto every blade we manufacture. This number allows us to track the blades from the raw material to the end user, YOU. If there's ever a question about performance or quality, we are able to track the blade back through the manufacturing process and identify potential areas of improvement. The identification number assures you of a product that performs well now and will continue to improve as we discover even better ways of producing blades that consistently give maximum performance.

DoubleHard Blades

Wood-Mizer DoubleHard blades are a combination of two different metallurgical techniques that result in superior hardness and toughness not found in other blades. The DoubleHard blades use high-quality steel and the teeth are induction hardened (Double-Hard-ened) so they stay sharper longer and can be resharpened often. The performance of these blades means higher productivity and lower cost per board foot.

SilverTip Blades

The SilverTip features much tighter manufacturing specs than the competition's blades. The SilverTip is made with a higher carbon content than DoubleHard blades, with a high-durability steel suited to high-volume sawing environments.

RazorTip Stellite® Blades

Wood-Mizer's RazorTip is a specialized Stellite-tipped blade for cutting tough wood. With excellent wear power and multiple sharpenings, RazorTip Stellite® sets the standard in blades. While other blades dull with only a few cuts, the RazorTip tipped blade stays sharp when cutting abrasive, kiln dried, tropical, specialty and other tough wood and beams. Each tooth is set and profile ground to exact specifications to ensure long life and quality cuts.

RazorTip Carbide Blades

This blade is part of the RazorTip blade family but features a specialized triple chip carbide-tipped tooth blade for sawing the hardest of hardwoods. The swedged style, carbide tipped tooth creates less sawdust and leaves behind a smooth finish, minimizing post-sawing processes such as planing or sanding. RazorTip Carbide blades are designed to stay sharper longer and skyrocket productivity for cutting abrasive hardwoods.

Bi-Metal Blades

Wood-Mizer's Bi-Metal is a blade engineered for production. With an RC hardness of 67 on the tooth edge, the Bi-Metal blade provides a longer sharp life. The tooth is manufactured with a ribbon of high speed steel that is electron beam welded to a high alloy backing material. This high alloy backing material offers a combination of durability and fatigue resistance, enabling a sharp life that is 2-3 times longer than carbon blades.

1.2 Which Blade Should You Use?

Three factors should be considered when determining which blade is best suited for your application:

1. Hook Angle.

   The hook angle (how far the tooth leans forward) should be chosen based on the type of wood you are cutting. Softwoods require higher hook angles (10-13°). Hard, frozen or knotty woods require lower hook angles (4-10°). The 10° hook angle is a good all-purpose profile recommended for most sawing applications.

2. Blade Thickness.

   Thicker blades provide faster feed rates and better cutting performance but require higher horsepower. Thicker blades also perform better in difficult sawing conditions such as knotty, frozen, dry or extremely hard material. Thinner blades provide longer flex life and are recommended for sawmills with lower horsepower or where production/speed is not a primary factor in your application.

3. Blade Width.

   As with blade thickness, blade width provides faster feed rates and increased cutting performance, but require higher horsepower. Wide blades can also be resharpened more often, resulting in more production during the life of the blade. Narrow blades perform better on low-horsepower sawmills and in some difficult sawing conditions.

See Table 1-1. See the table below for blade recommendations.

Blade Brand	Material	Purpose
DoubleHard Series	High Alloy	All purpose, durable blade for most sawing applications
SilverTip Series	Carbon	Ideal blade for primary and secondary breakdown
RazorTip Stellite®	Stellite® Tipped	Blade for cutting abrasive, kiln-dried, tropical, specialty, and other tough wood & beams
RazorTip Carbide	Triple Chip Carbide Tipped	Ideal blade for the hardest of hardwoods, and leaves a smooth finish
Bi-Metal	Tool Steel Tip with Alloy Steel Back	Specialty blade for longer run times in production sawing

TABLE 1-1

SECTION 2 BLADE GEOMETRY

See Figure 2-1. This illustration is referenced throughout this section.

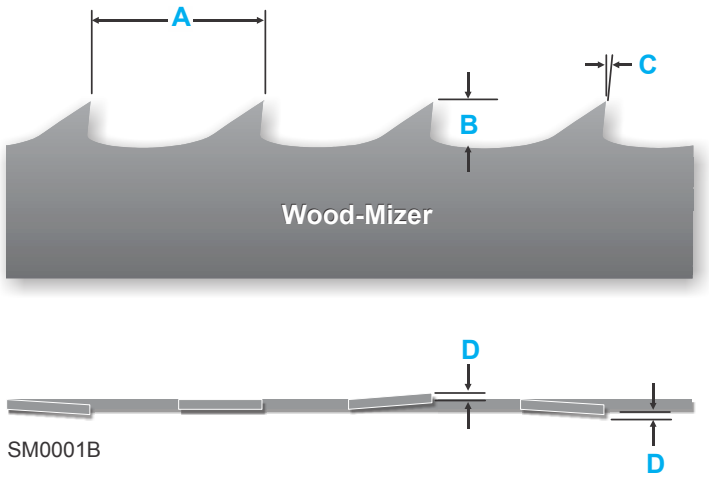

FIG. 2-1

A = Tooth Spacing
B = Tooth Height (Depth of Gullet)
C = Hook Angle
D = Tooth Set

Tooth Spacing

Tooth spacing is the distance between each tooth from one tip to another.

The term "pitch" also is used to in reference to tooth spacing. Pitch refers to the number of teeth per inch on a bandsaw blade.

Tooth Height (Depth Of Gullet)

Tooth height is the distance from the lowest point of the gullet to the tip of the tooth. The gullet is the area between teeth that carries sawdust out of the cut. Tooth height must be tall enough to allow the gullet to carry out all of the sawdust from the cut.

Wood-Mizer® blades are supplied with various tooth heights. Blades designed for cutting softwoods have taller teeth. Blades for sawing extremely hard wood or frozen logs have shorter teeth.

Hook Angle

Hook angle, tooth set, sharpness of tooth, and proper tooth height are the most important factors in the cutting ability of a blade. All four have an important effect on cutting quality and production.

The hook angle is the number of degrees that the tooth face leans forward of 90 degrees. The hook angle allows the teeth to "hook" themselves into the wood. The teeth must take out enough wood so that the blade feeds itself into the log. If the hook angle is too large compared to the feed rate, it causes chatter, a rough cut and poor cut quality. If the hook angle is too small, the blade must be forced into the log so that the saw will cut.

Too large or too small a hook angle will cause additional stress to the blade and will result in premature blade breakage.

As a general rule, more hook angle may be used to saw softwoods and less hook angle may be used to saw hardwoods.

Tooth Set

Tooth set is an important factor in the cutting ability of a blade.

The tooth set is the distance that a tooth is bent compared to the body of the blade. The set allows the back of the band to pass through the groove (kerf) which the blade has cut.

Wood-Mizer® blades are supplied with various amounts of set depending on the thickness of the blade and the type of wood it is designed to cut.

The more a tooth is set, the wider the cutting path of the blade and more horsepower required for maximum cutting rates.

As a general rule, a greater tooth set is used to saw softwoods and a lesser tooth set is used to saw hardwoods.

SECTION 3 BLADE STORING

WARNING! Always wear gloves and eye protection when handling bandsaw blades. Keep people away from work area when coiling or moving blades.

Use care when moving, storing, or handling blades. When blades are stacked or thrown together, the tips can be dulled or the set changed.

If storing blades for long periods of time, be sure the blades are dry then coat with lubricant.

Store blades in a clean and dry place.

SECTION 4 TROUBLESHOOTING

Our Resharp blade technicians have spent years evaluating blades sent to us by our customers. The advice provided in these sections can help you avoid common mistakes and maximize sawing performance and blade life.

4.1 Blade Breakage

Following is a list of some of the most common preventable causes of premature blade breakage:

Action	Result	Solution
Sawing too long with a dull or damaged blade	Stress in the band	Change the blade at regular intervals.
		Change the blade immediately after striking a foreign object or material.
Flat spots worn on blade guide roller surface	Vibration and heat in blade	Replace blade guide rollers as necessary.
Grooves in blade guide roller flange	Damage to back edge of blade	Replace blade guide rollers as necessary. Adjust for proper clearance between flange and blade.
Frozen or worn blade guide roller bearings	Heat buidup	Lubricate or rebuild roller bearings as necessary.
Chipped/broken blade guide wear pads	Damage to blade surface	Hone or replace wear pads as necessary.
Misaligned blade guides	Damage to blade surface	Check blade guide alignment at regular intervals and adjust as necessary.
Blade guide wear pads adjusted too close to blade	Heat on blade surface	Adjust wear pads for proper clearance.
Worn blade wheel belts	Heat caused by blade contacting blade wheel, blade wanders	Replace blade wheel belts.
Loose or damaged drive belts	Vibration, blade slippage	Adjust or replace drive belts
Sawdust between blade wheel and blade wheel belts	Vibration, blade slippage	Inspect blade wheels for sawdust at regular intervals and remove as necessary.
Improper blade tension	Stress in band	Regularly check blade tension while sawing and adjust to recommended range as necessary.

Dropping a tensioned blade down on a log or cant	Kinks, stretching	Replace the blade.
Excessive sap buildup on blade or blade wheel belts	Heat buildup	Use waterlube to prevent buildup. Remove blade and clean if necessary. Scrape buildup from belts.
Ramming blade into end of log or other stationary objects	Kinks in blade	Replace the blade.
Excessive pitch buildup on sides of the teeth	Heat, wavy cuts	Clean or replace blade.
Burning gullet of blade during sharpening	Breakage point	Use coolant during grinding. Use multiple passes through sharpener, removing smaller amounts of material each pass.
Large burrs created during sharpening	Breakage point	Use coolant during grinding. Use multiple passes through sharpener, removing smaller amounts of material each pass.
Too much or too little hook angle in tooth	Vibration and/or stress in the blade and slow cutting speed	Adjust sharpener to provide proper hook angle for material to be sawn.
Incomplete sharpening of tooth profile	Dull blade, breakage point	Sharpen complete profile.
Missing the outside corners (cutting tip) of set teeth	Dull blade	Sharpen complete profile.
Removing too little material from gullet	Fails to remove stress fractures	Adjust sharpener to take more material from gullet of blade.
Worn grinding wheel	Steel buildup in wheel reduces its grinding ability	Replace grinding wheel.
Incorrect grinding wheel shape	Sharp radius at base of tooth is condusive to stress fractures	Redress grinding wheel with proper profile.
Too much or too little set in blade	Vibration and/or stress in the blade and slow cutting speed	Adjust toothsetter to provide proper set for material to be sawn.
Toothsetter setting point strikes tooth too low	Distorts blade body, creating a place for fractures to occur	Adjust toothsetter so setting point contacts tooth properly.
Stored blades allowed to rust		Wipe blades dry before storing.
Storing blades without removing sawdust/sap residue	Oxides and acids can cause mircroscopic damage to the blade surface	Clean blade before storing.

4.2 Blade Performance

Using the appropriate blade for the species and condition of the wood your sawing is crucial to any sawing operation. Using blades with the wrong profile can cause the blade to chatter, too much sawdust, slow feed rates, premature blade breakage and premature dullness. If the appropriate blade is used, sawing performance problems can usually be attributed to the common causes listed below:

Problem	Cause	Solution
Wavy cuts	Sawing too fast	Use slower feed rate.
	Sawing too slow (increases sawdust that isn't cleared from the cut fast enough)	Use faster feed rate.
	Undertensioned blade	Check and adjust blade tension.
	Sawdust or pitch buildup on blade or blade wheels	Clean or replace blade and/or blade wheel belts.
	Blade not properly tracked on blade wheels	Check and adjjust blade tracking.
	Blade guide misalignment	Check and adjust blade guides.
	Incorrect drive belt tension	Check and adjust drive belts.
	Worn/damaged blade wheel belts	Replace blade wheel belts.
	Worn blade wheel crown (beltless steel blade wheels only)	Replace blade wheels.
	Loose or worn blade wheel bearings	Replace blade wheel bearings.
	Improperly adjusted mast pads	Adjust mast pads properly.
	Blade not parallel to sawmill bed	Align sawhead and bed rails.
	Loose blade guide arm	Adjust blade guide arm rollers.

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