Red Streak®

Narrow Kerf bandsaw blades

The purpose of this booklet is to provide you a better understanding of the factors that impact narrow kerf bandsaw blade performance. Necessarily, much of the discussion centers on the machinery used and species sawn as well as the saw blades themselves.

Given the fast paced development of both machine and saw blade technology for these markets, subsequent reprints and updates of this booklet are inevitable. Having stated that, what follows is the best of what is available today to help you get the most out of your narrow kerf bandsaw blades.

Simonds International
www.simondsinternational.com
800-343-1616

SAW BLADES

The narrow kerf bandsaw blades used on multiple head resaws, single head resaws, scragg machines and portable sawmills are generally available in four different widths -1", 1-1/4", 1-1/2" and 2" wide. Blade thickness is generally .035", .042" or .050". Bands with a thickness of .035" are most appropriate for machines with wheel diameters of 24" or less, or when trying to achieve maximum fiber yield. Bands with a thickness of

.042" or thicker perform best on machines with wheel diameters greater than 24" where maximum beam strength is critical for faster, more accurate cuts. Bands .042" or .050" thick should not be used on machines with wheels under 24" in diameter, as body cracks may quickly develop.

Specialty bands utilizing a thickness of .050" are gaining popularity in high production and industrial applications. These are normally found in body widths of 1-1/2" or greater, and are designed to provide accurate cuts in extremely hard lumber or in tough secondary applications. Bands with a thickness of .050" generally offer the least amount of fiber yield. Certainly other widths and thickness are used in specialty applications, but these represent the majority used today. The most common type of saw blade used for narrow kerf bandsawing is a carbon steel blade.

Carbon Steel blades are available with three different heat treatments and hardness conditions -Constant Hardness, Flex Back (also referred to as Hard Edge) and Hard Back. The alternative to carbon steel blades would be Simonds Red Streak Specialty blades with carbide or high speed steel teeth.

Constant Hardness- The entire width of the blade has the same hardness. This type of blade usually has a hardness of approximately 45 on the Rockwell C scale. The low carbon steel used for this type of saw has very good flex life, but cannot be heat treated to the higher hardness of the other types of saws. This degree of hardness is approximately the same as you would find on conventional swage tooth wide bandsaws and is sufficient for cutting most wood species.

Flex Back / Hard Edge- This type of saw is commonly referred to by either of these two names. The steel alloy used to produce Flex Back type saws - and Hard Back as well - has higher carbon content than the steel used for constant hardness saws. The cutting edge of this type of saw blade is hardened to approximately 63 - 65 on the Rockwell C scale. This hardness carries down approximately one half the height of the tooth. The body of this type of saw blade is at the 'as rolled' hardness, usually 30 - 33 Rockwell C. An advantage of this type of blade over Constant Hardness saws is the harder cutting edge will stay sharp longer. The softer body resists fatigue cracks and works well on bandsaw machines with relatively small wheels, under 24". You may occasionally see a black line along the back edge of a flex back saw. This is a heat line produced during the manufacturing process to ensure proper straightness of the blade. Do not confuse this with a Hard Back type saw.

Hard Back - This is generally the premium type of carbon bandsaw blade. The cutting edge of the saw is heat treated to 63 - 65 Rockwell C. The body of a hard back type saw receives an additional heat treatment to increase the hardness of this section to approximately 45 Rockwell. This, in effect, results in a spring temper for the back of the saw. The additional heat treatment increases the tensile strength of the blade over 50% and results in the ability to withstand higher tension and feed speeds. This dual heat treat produces a saw with a hardened long lasting cutting edge and a stiff straight cutting body. All Simonds Hard Back blades offer a "Ground" cutting edge. The sharpness of ground tooth saws is far superior to conventional milling, broaching or punching blade manufacturing processes.

Red Streak Specialty Blades- For the purposes of this booklet, Specialty Blades include carbide tipped, and high speed steel tipped bandsaw blades. The principle behind specialty bandsaw blades is they combine the superior flex life of a low carbon steel backer with the edge holding ability of an exotic alloy. Due to the more involved manufacturing process for these saw blades, the cost is significantly higher than carbon steel blades. Specialty blades have proven to be economical only in relatively specialized applications. One or two blades that break before they get dull can quickly wipe out any potential savings or benefit.

CHOOSING THE PROPER SAW

One fact must be accepted before we can proceed with the discussion of which blade to choose. All bandsaw blades will eventually fatigue and break. A blade which never produces a foot of boards will eventually break if put on the bandsaw machine and allowed to run. This is a function of the Flex Life of the steel. The efficient sawyer chooses a saw blade which yields the best balance of Flex Life and edge holding ability.

The two extremes would be a saw still sharp when it fatigues and breaks and a saw that dulls quickly and won't cut, but also will not break. Each of the four types of saws has their advantages and no one blade is best for all applications.

The question of which blade to use is related to the type of machine and blade life goals. Constant Hardness blades have good flex life, but dull relatively quickly. As a result, this type of saw blade is useful in low to moderate production applications such as on portable sawmills.

A bandsaw blade on a portable sawmill is generally "in the cut" less relative to the number of times it rotates around the wheels than you would find on a multiple head resaw. As a result, edge holding ability is often seen as secondary to flex life in this application. It is certainly not economical to replace a sharp blade that fatigued and broke due to poor flex life. An alternative to constant hard-ness saws on portable saw mills is the flex back blade. Flex back blades offer the superior edge holding ability of a heat treated blade. The relatively soft body of the saw compensates for the higher carbon content and gives satisfactory fatigue or flex life.

Flex Back blades have very good edge holding ability. The relatively soft nature of the body of the blade enables it to run successfully on very small band wheels. Flex back blades are economical to use and will also perform very well in multiple head resaw applications. Flex back blades can be sharpened. However, due to the soft body of the blade, once the saw has been ground past the heat treated tooth area, the blades must be discarded.

Hard Back blades, like flex back, have very good edge holding ability. The hardened backer also results in a stiffer blade that provides very straight cuts even under the highest feed rates. Hard Back blades can be sharpened many times. Even once ground past the tooth hardened area, the backer is sufficiently hard, as hard as constant hardness blades, to satisfactorily cut wood. Hard back blades should not be used on machines with small wheels, under 30", as body cracks may develop. Various specialty blades have been developed to meet the specific needs of some unique operations. Simonds Red Streak Specialty bands are available with Carbide tips and High Speed Steel tips. The practicality of these specialized and more expensive to purchase saw blades must, of course, be determined by the user. Generally speaking, use of these specialty blades is restricted to a minority of users and will not be discussed in any great detail in this edition of this booklet. Should you determine carbon bandsaw blades are not the most economical or efficient saw for you, then you may consider using these more exotic blades.

SHARPENING

The preceding paragraphs mention sharpening narrow kerf bandsaw blades. The practicality of sharpening blades really comes down to a question of time and economics. Most narrow kerf bandsaw machine owners calculate their cost per cut with the knowledge that the bandsaw blade is a "throw away". Others attempt to control bandsaw costs through the use of sharpened blades. These are the two schools of thought when it comes to minimizing narrow kerf bandsaw blade costs, sharpening and not re-sharpening. The "best" approach will depend primarily on your labor costs. One school of thought is to run blades as long as feasible, minimize "down time", and dispose of the blades when they get too dull to run or eventually fatigue and break. Following this method, the mill need not concern itself with maintenance equipment, or expensive down time from inconsistent lengths of run time. New blades will, if properly welded and properly handled, all run for approximately the same length of time before failure. This allows for scheduled blade changes and minimal mid-shift down time. Unscheduled downtime, a common problem with sharpened blades, can quickly wipe out blade cost savings by idling workers. The key to success when not sharpening is to purchase the best quality, most consistent band-saw blades possible and to minimize purchase costs.

The second school of thought is to sharpen bandsaw blades. Done properly, this can be a very economical way to run a narrow kerf bandsaw operation. There are two main points to consider when deciding whether or not to sharpen narrow kerf bandsaw blades.

Point 1. Labor and Maintenance Cost. How much does your labor, both your own and/or your employees cost per hour, wages and fringes? Will your sharpening employee be idle most of the time, or do you now have an under-utilized employee with the aptitude to do your sharpening work? Labor costs must be evaluated with consideration of how many blades will be sharpened by the employee per hour. Other costs the mill must evaluate are identification and acquisition of quality sharpening equipment, grinding wheels, inspection gauges, etc. Mill owners may find that the true cost of a sharpened blade is not significantly less than that of a factory new blade. And, of course, a sharpened blade may not last as long as a new one.

Point 2. Actual Benefits. Narrow kerf band-saw blades eventually fatigue and break. Premature blade failure can be minimized through use of as large a band wheel diameter as feasible and through proper saw guide maintenance. It is difficult to predict how long sharpened blades will last versus a new blade and the timing of blade failure can often determine the economics of whether or not sharpening is worthwhile. The sharpened blade may fail shortly after sharpening due to: steel fatigue from a blade run too long when dull or improperly set guides may have heated the blade, or the employee sharpening the blade may have distorted or over heated the gullet.

As with most business decisions, accurate estimation of costs help ensure sound decision making. The question management must answer is whether the benefit of an additional run is worth the downtime that may result from an unscheduled blade change?

STRAIN/TENSION

One of the most frequently asked questions is, "What is the proper strain or tension for my machine?" (For the purposes of this booklet, the words 'Strain' and 'Tension' are used interchange-ably to describe the pressure used to keep the saw blade taught on the band wheels and produce a straight cut.) This is also one of the most difficult questions to answer directly. The correct answer is the least amount of pressure necessary to achieve straight cuts and prevent the saw blade from slipping on the drive wheel. Any amount of pressure applied in excess of the amount necessary to produce straight cuts simply leads to pre-mature blade failure.

Since most of you reading this booklet want a number, here it is - 25,000# - 28,000# of pressure per square inch of bandsaw material. How does one calculate this? Generally the bandsaw ma-chine manufacturer has calculated this and your machine owner's manual will direct you to simply engage a spring, run 90 psi of air pressure, or pump a cylinder to a reading of say 2,300 on a dial indicator. As the machine operator, you can check the amount of strain or tension your machine applies in one of two ways. You can calculate the pressure psi based on the cylinder size, shaft size, and amount of air pressure or size of spring relative to square inches of bandsaw blade. Or, you can use a tool called a **Digital Strain Gauge**.

A Digital Strain Gauge is a simple to use tool which is factory calibrated to measure the amount of stretch a bandsaw blade experiences when the strain is applied to a saw blade. The tool converts this into a reading on a dial indicator. The Digital Strain Gauge will display the distance the blade has been stretched. Simply reference the included table to determine the PSI used for that amount of stretch. Most sawyers will find that stretching their blades 0.006", as measured with a Simonds Digital Strain Gauge, is optimum.

While on the topic of strain, in addition to applying the minimum amount of strain necessary to produce a straight cut, you must always release the strain whenever you are not cutting. It serves no good purpose to keep the saw blade under strain during dinner breaks or overnight. This is particularly important in cold weather. A saw blade warms up while cutting and will generally stretch. (It is good practice to check and adjust the strain after a saw has warmed up.) As the saw cools and contracts, during a break or overnight, it is not unusual for a blade to break if the strain is left on the blade.

Variables That Affect Bandsaw Blade Performance

1. Machine Operator
2. Type of Bandsaw Machine
3. Condition of Bandsaw Machine
4. The Bandsaw Wheels
5. Saw Guide Condition
6. Saw Guide Position
7. Species Being Sawn
8. Strain or Tension
9. Saw Blade Break-in and Operation
10. Saw Blade Speed and Feed Rate
11. Saw Blade Specifications

1. The Machine Operator

Often preached, seldom practiced, is the principle that periodic operator re-training is a sound business practice. At the first sign of any change in saw blade performance, it is good advice to objectively evaluate the operating procedure. Whether you are the owner/operator, long time employee or new hire, review your machine Owner's Manual regularly to ensure you are not developing any bad habits or shortcuts. Most Owners' Manuals contain a troubleshooting section. The Troubleshooting section of the Owner's Manual should be copied and be readily available to the machine operator.

2. The Type of Bandsaw Machine

Not all bandsaw machines are engineered equal. When evaluating the performance of a bandsaw blade, one must ensure the correct ma-chine is being used for the application. The variety of machines available today has resulted in considerable specialization. Ensure the machine is performing the job it was engineered for, Scragg, Edger, Resaw or Log Processing.

3. The Condition of the Machine

Both dramatic and progressive changes in saw blade cutting performance can often be attributed to a change in the operating condition of the bandsaw machine. Worn belts, leaky cylinders, stripped bolts, fatigued springs, air leaks and power losses will all impact the performance of a band-saw blade. Be sure the machine is in good working order before the type or brand of bandsaw blade is changed. No bandsaw blade will perform satisfactorily for any period of time on a machine in need of repair. One common problem affecting saw blade performance is the gradual wear on the equipment used to secure the wood during the cut and wear in the tracks of machines where the saw moves through the wood.

Should belts or hold downs fail to secure the wood properly you will have excess movement which can lead to blade failure.

4. The Bandsaw Wheels

The diameter and condition of the bandsaw wheels will affect saw blade performance. Wheels of relatively small diameter, less than 25", will generally work best with thin bandsaw blades, .035", of the hard edge type. Larger diameter wheels afford the operator the option of using the thin blades, choosing a thicker blade, or opting for the hard back or specialty types.

Bandsaw blade performance will also be affected by the surface condition of the bandsaw wheels. Whether the wheels are steel or rubber covered, the surface should be smooth and free of lumps and bumps. Bandsaw wheels must be kept clean of waste and sawdust build up. Rubber covered wheels must be free of cracks and chips.

Steel wheels should be reground if excessive wear is evident. Bandsaw blade performance is also affected by bandsaw wheel alignment. Improper tracking, due to either poor wheel alignment or wheel wear, is likely to result in the set being knocked out of the band, the production of poor quality lumber and unsatisfactory blade life. Check the machine owner's manual to ensure proper wheel alignment and tracking.

5. Saw Guide Condition

Although Saw Guide Condition is #5 on this list, followed by Saw Guide Position at #6, when it comes to factors affecting saw blade performance they are a principle reason for both poor blade performance and poor quality lumber.

Worn or malfunctioning saw guides will result in premature saw blade breakage. Roller guides that have seized will case harden the blade resulting in cracks and breakage. Worn or improperly positioned guide blocks, carbide, steel or composite, will allow the blade to deviate in the cut giving poor quality lumber and broken blades.

Saw guides should be inspected on a regular basis to assure proper clearance, no more than .003" for blocks, and free movement of roller guides. A good start for the inspection program is at least each time a blade is changed or twice per shift.

6. Saw Guide Position

The first component of saw guide position is relative to the bandsaw blade. The function of the saw guide is to support the blade while cutting. The guide should not maintain constant contact with the saw, as this will generate heat and premature failure. The owner's manual will detail the method of adjusting the guides. Side guides, block or roller, should have no more than

.003" clearance. This can be checked with a feeler gauge. Back guides should be 1/32" - 1/64" away from the back of the blade. Problems will arise from constant blade contact with the back guide. This will lead to back edge mushrooming, back cracks and deviations in the cut.

The second component of Saw Guide position is relative to the work piece. Guides must be positioned to support the bandsaw blade as much as possible during the cut. Therefore, the guide arm must be moved as close to the log or cant as possible. Guides on portable sawmill machines should be repositioned as the log diameter is reduced. Whenever feasible, cants and logs should be sorted so the guide can be moved close to the narrowest cant on resaw applications. A guide arm positioned more than 1" from the edge of the work piece can result in uneven lumber.

7. Species Being Sawn

The vast variety of species being utilized by the lumber industry today - and processed on narrow kerf bandsaw machines - necessitates a realization that the same bandsaw blade on the same model machine cutting different species or even the same species in a different environment can yield different results. The point here is to consider species when evaluating the performance of a bandsaw blade or bandsaw machine. Refer to the specific gravity chart in the rear of this booklet for relative specific gravity ratings. In the most general of terms, the higher the specific gravity of a species the more difficult it is to cut. Bottom line, don't expect the

same performance when cutting Hickory (.066) as when cut-ting Poplar (.040).
Also consider that more side clearance is necessary in green softwoods than in hardwoods, frozen wood or dried wood.

8. Band Strain or Tension

A definition first. Strain or tension in this context refers to pounds of pressure exerted to keep the band wheels apart and assure straight cuts. Do not confuse this with Tension of a circle or wide bandsaw which refers to the stretching of steel of these cutting tools.
Strain or tension will affect the performance of a bandsaw blade in three ways. Too little strain will result in the blade slipping on the wheels, stalling in the cut, being pulled of the band wheels, premature blade breakage or inconsistent lumber. Too much will result in premature blade breakage, bearing problems or excessive heat buildup. The proper amount results in an efficient productive cutting operation. The first source for the proper amount of strain should be the machine owner's manual. The various methods of applying this pressure - air, hydraulics or springs - will result in many different calibration or gauge readings on the machines. The best way to assure consistent and proper pressure is being applied is to properly maintain the machine and periodically check strain with a tension meter. The Simonds tension meter, called a Digital Stain Gauge, is calibrated to convert the actual amount the steel is stretched, by the machine under tension, into a digital measurement. Most machines and bandsaws will run

best with a reading of 25,000 - 28,000 pounds of pressure per square inch of bandsaw blade material as measured with a Simonds Digital Strain Gauge.

9. Bandsaw Blade Break-In and Operation

All cutting tools perform best if properly broken in. It is best to run the saw blade at approximately one half normal feed rate for the first few cuts to hone the cutting edge. Blade will also perform best if it is always in the cut. Specifically, on single and multiple head resaws, it does the bandsaw blade no good to be constantly impacted by the cant. It is much better for the feed speed to be adjusted to match the production speed. Feed the cants butt to butt. An accelerating cant impacting the blade drives the blade into the back guide, risks damaging the tooth and can knock the set off the blade by having the blade ride back on the wheel.

Two other operational practices which will have an adverse impact of the blade life are **idling and skimming**. Both of these two practices should be kept to an absolute minimum.

Idling - Stopping the feed while a cant or log is in the cut.

This causes tooth rubbing - as opposed to cutting - and heat buildup. Heat buildup and tooth rubbing will result in premature blade failure.

Skimming- Cutting with only half the blade.

When a cant is too thin for the blade to cut or the blade height is not properly set for cant width, the blade can ride out of the cut and skim along the outside of the board. This will damage the set on the outside of the blade, cause premature blade failure and poor quality cuts.

10. Saw Blade Speed and Feed Rate

Blade speed will affect the performance of the bandsaw blade if it is not properly coordinated with feed speed and tooth space. Nothing is gained by running the feed speed faster than the machine operators can handle. The results will be reduced blade life and inefficient labor. Generally, blade speeds between 4,500 - 7,500 surface feet per minute (sfpm) works well with most standard band-saw blade tooth spacing. Adjustments to improve efficiency are usually accomplished with the machines variable feed speed. You must know where your machine "is" before you can make informed decisions about where to go with it - faster or slower. To check the saw blade surface speed per minute, multiply the wheel RPM times the diameter of the wheel in feet, times 3.14. Following are some examples and tables related to tooth bite and feed speeds.

Bite per tooth equals teeth per minute entering the cut divided by feed in inches per minute.

Teeth per minute equals teeth per foot times blade surface speed in feet.

Teeth per Minute Example:

Blade Surface speed equals 7,000 SFPM

Tooth Space	Tooth Space	Teeth Per Foot	SFPM	TPM
1-1/4"	1.250	9.6	7,000	67,200
1"	1.000	12.0	7,000	84,000
7/8"	0.875	13.7	7,000	96,000
3/4"	0.750	16.0	7,000	112,000
1/2"	0.500	24.0	7,000	168,000

Sample Feed Speeds:

Feet per Minute	Inches per Minute
25	300
35	420
45	540
55	660
65	780
75	900
85	1,020
95	1,140

Bite per Tooth in inches for various Feed Speeds in Feet per Minute (FPM) and Tooth Spacing at a blade speed of @ 7000 SFPM.

Tooth Space	25 FPM	35 FPM	45 PFM	55 FPM
1-1/4"	0.0045	0.0063	0.0080	0.0098
1"	0.0036	0.0050	0.0064	0.0079
7/8"	0.0031	0.0044	0.0056	0.0069
3/4"	0.0027	0.0038	0.0048	0.0059
1/2"	0.0018	0.0025	0.0032	0.0039

Tooth Space	65 FPM	75 FPM	85 FPM	95 FPM
1-1/4"	0.0116	0.0134	0.0152	0.0098
1"	0.0093	0.0107	0.0121	0.0079
7/8"	0.0081	0.0094	0.0106	0.0069
3/4"	0.0070	0.0080	0.0091	0.0059
1/2"	0.0046	0.0054	0.0061	0.0039

In the "Old School" of lumber production using inserted tooth circular saws, the distances above would represent the distance between scratch marks. In resaw applications, is it any wonder we are dealing with "dust issues" given the bite per tooth shown above.

Again, you must know where your machine "is" before you can make informed decisions about where to go with it - faster or slower.

TROUBLESHOOTING GUIDE

Saw Overheats

- Excessive feed speed
- Variability in wood - species changes
- Saw guides set too tight
- Insufficient side clearance
- Uneven side clearance

Saw Snakes in Cut

- Hold downs not set properly
- Excessive feed speed for saw blade
- Poor wheel alignment
- Improper strain
- Uneven side clearance
- Dull teeth
- Inadequate gullet capacity

Saw Dodges When Entering the Cut

- Entering the cut too fast
- Insufficient strain
- Excessive side clearance

Saw Deviates Constantly In the Cut

- Faulty wheel alignment
- Unequal side clearance
- Incorrect strain

Saw Vibrates

- Improperly adjusted saw guides
- Wheels out of balance
- Worn bearings

Saw Oscillates On Wheel

- Dirty wheels
- Improper wheel alignment

Poor weld alignment
Incorrect strain
Improper back - too much or too little sweep

Saw Blade Breakage

Dull teeth
Incorrect tooth space or tooth shape
Hook angle - blade or machine related
Poor weld
Excessive strain
Saw guides improperly set
Improper wheel alignment - cross lines
Contact with back guide
Excessive blade speed
Saw gauge too thick for wheel diameter
Wrong saw type used-Flex Back, Hard Back
Worn bearings and vibration
Improper sharpening technique
Faulty wheel faces/surface

GLOSSARY

Air Bags- A common method of using air pressure and expandable rubber sacs to apply strain to the bandsaw blade.

Anvil Line- The mark on a Spring Set tooth where the bending begins.

Camber- See Sweep.

Cant - A block of wood which has been cut from a log. Can be square or 'three sided', with bark or wane on the sides.

Edger - Machine used to cut boards to width or remove the wane from a flitch. Can be either bandsaw or circle saw machine.

Feed Speed- The rate at which the cant or log is fed through the saw blade. Usually referred to in feet per minute (fpm).

Flitch - A board with bark or wane on the edge(s).

Gauge - The thickness of the saw blade, best expressed in decimals of an inch or in "Birmingham" gauge.

Guide Arm- Brackets used to secure and position saw guides.

Guides and Saw Guides- Support devices above, below and behind the saw to minimize variation and prevent the saw from deviating in the cut. Types are Roller or Block.

Head Saw- A machine used in the primary break-down of a log, to produce cants or to completely process a log.

Hold Down - Mechanism used to maintain positive contact between cant and feed belt. The hold down prevents vertical movement of the wood while it is in cut.

Hollow - See Sweep.

Hook or Hook Angle- The angle at which the face of the tooth contacts the material to be cut. Note, actual or effective hook angle can be affected by the bandsaw machine set up, in addition to the hook angle of the saw blade itself.

Kerf - The amount of material the saw blade removes from the work piece.

Multiple Head Resaw- A bandsaw machine with two or more horizontal bandsaws sequentially in line producing multiple boards from a cant in one pass. A 'Head' being one horizontal bandsaw unit.

Pitch- See Tooth Space

Raker Tooth- A tooth within a set sequence which is not spring set. The kerf of a raker tooth is the thickness of the bandsaw stock. The primary function of a raker tooth is to aid in chip removal.

Resaw- A machine or saw blade used to cut cants or material which has already been partially processed.

Scragg Mill- A machine used to produce three or four sided cants by cutting slabs off the log. This type machine generally has two, three or four saw blades and can utilize either bandsaw or circular saw blades.

Set or Spring Set - Alternately bending saw teeth right and left to provide clearance and produce a kerf wider than the blade.

Set Sequence- The sequence within a saw blade of the set. Set sequence should be described with the teeth pointing up and toward you. Red Streak is left, right, raker.

Skimming - The practice of running a bandsaw blade such that only one side maintains contact with the cant. This practice results in damaged set, a poor saw performance.

Slabs - The first board cut off a log. Flat on the saw blade side and crescent shaped on the outer side.

Strain- The pressure used to push the band wheels apart, prevent the blade from slipping on the wheels and keep the bandsaw blade taught in the cut. Also referred to as Tension.

Swage - A method of shaping a tooth to provide side clearance or kerf on both sides of the saw blade with each tooth.

Sweep- The amount a saw blade deviates from being completely straight on the back edge. All narrow kerf saw blades should be longer on the back edge of the saw than the tooth edge. This is necessary to offset the heat expansion that lengthens the cutting edge when sawing. The amount of 'sweep' - also referred to as Camber or Hollow -must be described over a fixed distance e.g., .015" in 18", 1/2" in 6', or 1" in 13', etc. In sawmill widebands this feature is called "Back".

TPI or Teeth per Inch- The number of complete teeth within one inch. This nomenclature is commonly used for fine tooth metal cutting bandsaw blades. To convert TPI into Tooth Space, divide 1 by the TPI. This results in the decimal distance from tooth tip to tooth tip. Example - 1.33 TPI, 1 ÷ 1.33 = .75" or 3/4" Tooth Space.

Tension - When used relative to narrow kerf bandsaw blades, Tension relates to the pressure used to push the band wheels apart and keep the saw blade taught in the cut. Also referred to as Strain. Tension relative to conventional wide band-saws and circle saws is not used on narrow kerf bandsaw blades.
Tooth Space- The distance from saw tip to saw tip. Also referred to as Pitch or TPI.
Wane- Bark or curved outer portion of the log that remains on the edge of a board after it is cut.

SPECIFIC GRAVITY VALUES

Hardwood Species		Specific Gravity
Ash		0.55
Aspen		0.35
Basswood		0.32
Beech		0.56
Cherry		0.47
Gum	Black	0.46
	Tupelo	0.46
Hickory	Pignut	0.66
	Shagbark	0.64
Locust	Black	0.66
Maple	Silver	0.44
	Sugar	0.56
Oak	Northern Red	0.56
	Southern Red	0.52
	Post	0.60
	White	0.60
Pecan		0.60
Poplar	Yellow	0.40
Walnut		0.51

SPECIFIC GRAVITY VALUES

Softwood Species		Specific Gravity
Cedar	Western Red	0.31
	Eastern Red	0.44
Douglas Fir	Coast	0.45
	Rocky Mt.	0.40
Fir	Balsam	0.34
Hemlock	Western	0.38
	Eastern	
Pine	White	0.34
	Loblolly	0.47
	Long Leaf	0.54
	Ponderosa	0.38
Redwood		0.38
Spruce	Sitka	0.37

NOTES: