

# COMMON SAWING QUESTIONS ANSWERED

**Q:** *What determines the choice between bi-metal and carbon blades?*

**A:** Basically, material and desired performance. Most tougher materials, such as stainless steel, either can't be cut by carbon blades, or take so much longer and use up so many blades that the cost is ridiculous. On the other hand, very abrasive materials, such as fiberglass, wear the teeth of any blade – bi-metal or carbon – so quickly that an economy carbon blade with lowest cost should be used. Bi-metal blades should always be used on automatic machines and in any operation where the requirement for high performance is paramount. For tool and die contouring, narrow width bi-metal blades outperform carbon blades up to 10 times.

**Q:** *How should tooth pitch be selected?*

**A:** The basic rule is to keep 3 teeth minimum, 6-12 teeth optimum in the material for bi-metal blades, 6-18 teeth for carbon blades. Fewer teeth than this range risks tooth strippage, more teeth risks both strippage and gullet clogging. The range can be achieved through the correct combination of tooth pitch and proper vise loading.

**Q:** *What is a variable pitch blade, and when is it used?*

**A:** A blade with teeth which vary in gullet depth, set angle and number per inch (pitch). Less vibration, less noise and smoother cuts are the benefits. Variable pitch blades are particularly beneficial for cutting tubing, structurals and other interrupted surfaces which tend to induce strong vibration forces. When combined with positive rake, the variable pitch blade has no equal for faster work penetration and increased sawing productivity.

**Q:** *At what hardness do various materials become non-machineable with bi-metal blades?*

**A:** It depends on the grade. Although we have used saw blades to cut metal with a hardness as high as Rockwell (Rc) 47, in general the practical limit is Rc40. Above that, the blade may saw the material, but blade life will be severely curtailed.

**Q:** *When is a flexible back band saw blade used?*

**A:** On materials which can be cut at high speeds (up to 15,000 fpm), such as aluminum, babbitt, brass, cast iron, copper and lead. The flexible back enables the blade to take the turns around the machine wheels with less fatigue (and hence longer life) than a blade with a hardened back. Avoiding the costs of hardening make flexible back blades desirable where a lower performance, economy blade is acceptable.

**Q:** *What is the best way to determine speed and feed?*

**A:** Speed charts are usually a good guide to select starting speed. Feed controls vary widely from machine to machine (some are calibrated in pounds, others in arbitrary scales of number). Therefore, after break-in (see next question), chips are the best guide to correct feed and speed: *Powdery?* Increase feed. (Powdery chips are O.K. when cutting certain cast irons and D-2.) *Thick, tightly wound?* Increase speed. *Hot, purple-blue?* Decrease speed. Chips should be nicely curled, silvery in color and warm – but not hot – to the touch.

**Q:** *Why is break-in so important, and how is it done?*

**A:** A brand new blade has extremely sharp points on the teeth. If brought to the work surface under normal feed pressure, without break-in, these points would rip off, leaving jagged-edged teeth that would wear faster and cut rougher. Break-in always involves very light feed pressure at the start, with full normal pressure achieved gradually. A blade should always be broken in on the same material it will be cutting. The number of cuts (square inches of material) before reaching full normal feed pressure varies according to the type of material being cut.

**Q:** *Why do some blades break when there is obviously plenty of life left in them?*

**A:** There are two possible explanations. One is that the machine is out of adjustment – wheels worn or out of alignment, guides not aligned or incorrectly spaced, blade tension too high or too low. The other explanation has to do with machine design in relation to the blade being used. The wheel diameter may simply be too small for the blade, and/or the guides can't be moved far enough from the wheels, causing accelerated blade fatigue.

**Q:** *How important are the chip brushes on a saw machine?*

**A:** Extremely important. Their purpose is to remove chips from the gullets of the blade and thus keep them off the wheel surfaces and out of the wheel bearings – thereby prolonging the life of these machine components. Furthermore, if the teeth return to the cut with chips in the gullets, there is increased likelihood of tooth strippage. With clean teeth, you get better penetration and less tooth damage.