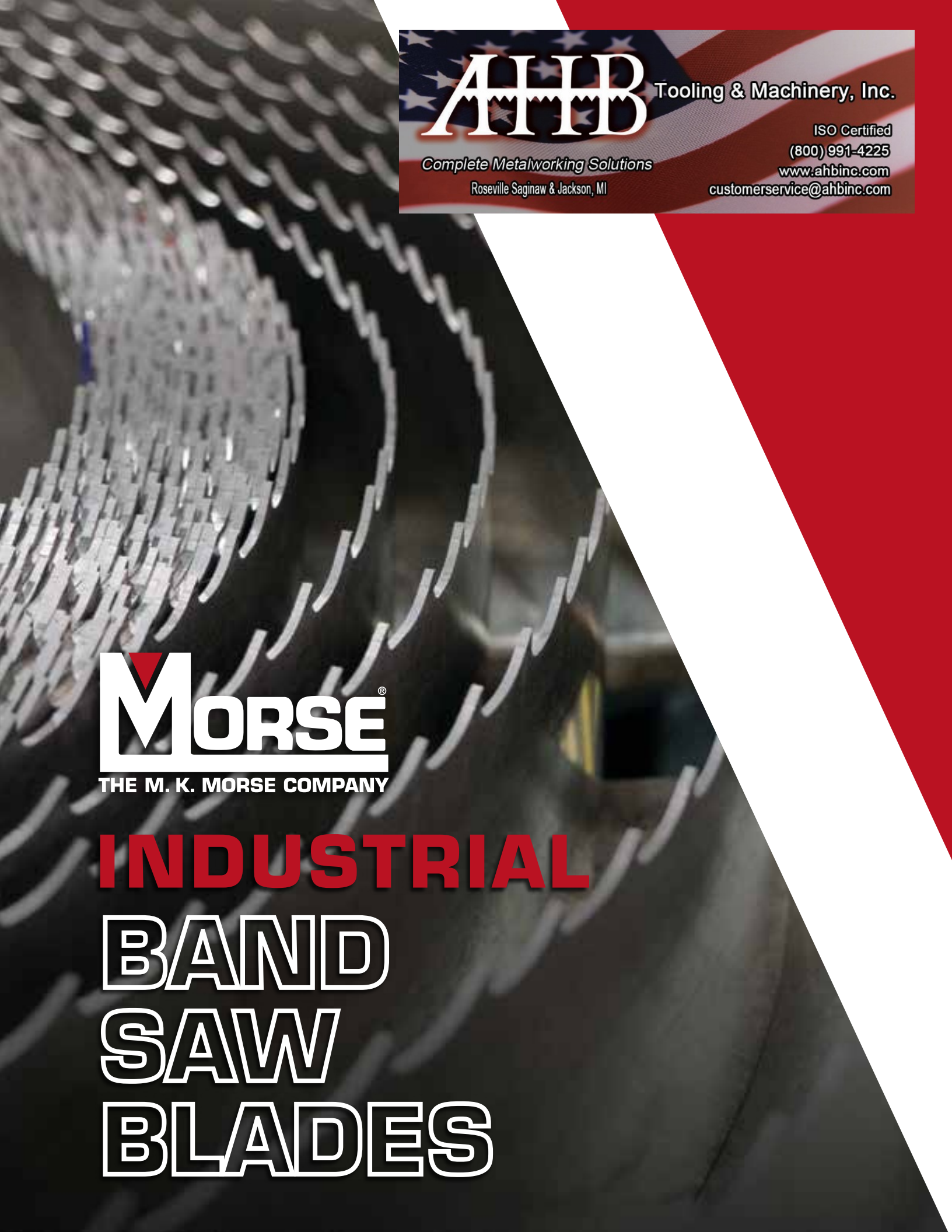


MORSE®
THE M. K. MORSE COMPANY

INDUSTRIAL BAND SAW BLADES

Table of Contents

When You Need Saw Blades, You Need Morse

For more than 50 years, we've been selling, innovating and manufacturing an array of material separation solutions. And while our product's design, workmanship and performance are unparalleled, it's our exceptional service levels that make us your best source for saw blades.

Regardless of machine, material or application, Morse has the right saw blade for the job. Our team of experienced, highly trained field technicians helps you get the most performance out of your operator, your equipment, and your saw blade. Whether your primary cost driver is speed or cut quantity, we deliver custom solutions to fit your saw, your budget, and your business.

Virtually all Morse product is manufactured in Canton, Ohio, USA. And with Morse product sold in more than 70 countries, our global distribution network and weld centers ensure that our customers get the right product, right when then need it.

As a second-generation, family-owned business, we take pride in serving customers at the highest levels. We've embraced lean manufacturing, and each of our workers are cross-trained in several departments to help insure consistency, reliability and quality in everything we produce.

All we make are saw blades. And we make them exceptionally well.

Not All Materials Are Created Equal

Our in-house team of materials scientists and engineers is the best in the industry. They continually test, improve and refine all facets of our products -- from raw materials and tooth design to proprietary treatments and coatings. Our manufacturing processes continually improve to exceed the rigorous demands of our customers.

We proudly support customers from small machine shops and steel service centers to large defense contractors and government agencies. No task is too big or too small for us to tackle. Best yet, we haven't found a material yet our team can't cut.

Experience The Morse Difference

In addition to our innovative products and world-class service levels, we've established a unique training curriculum at our factory that further supports and educates our customers on how to optimize their material separation processes. We regularly host people from across the globe at two-day, immersive sessions to bring better understanding to the ever-evolving world of saw blade technology.

If you've been a M. K. Morse customer for some time, thank you for your business. And if you're considering us now, we encourage you to take a moment to understand how the right saw blade can make or break your productivity, operational efficiency, and your budget.

Thank you for the opportunity to serve you.

Happy sawing!

The charts on this page provide a general overview of the types of M. K. Morse band saw blades best suited to a variety of different metal cutting applications. There are factors such as the type of saw in use and the specific goals of the cutting process which also come into play when choosing a blade. Contact a Morse technical advisor for your specific needs.

Blade Wizard®

Visit the Morse BladeWizard® on-line to select the right blade for your application:
bladewizard.com

MORSE BI-METAL BAND SAW BLADE APPLICATION OVERVIEW

Selection Based Upon Target Application

	CARBON STEELS	STRUCTURAL STEELS	ALUMINUM & LT. ALLOY STEELS	ALLOY STEELS MOLD STEELS	TOOL STEELS	STAINLESS STEELS	NICKEL BASE ALLOYS	TITANIUM ALLOYS
AISI	1010, 1020, 1045	A36	6061, 2011 2024, 5052	4140, P20	A2, H13, S7 M-SERIES	316, 304 17-4 PH, 15-5 PH	INCONEL, MONEL, WASPALLOY	T1-6Al-4V
JIS	S20C, S4SC		6061, 2011, 2024, 5052	SCM 440(H), SCM 445(H)	SHD11, SHD12, SKD61, SKS41	SUS316, SUS304	NCuP-O	H4650, H4600
DIN	Ck45, C16.8		AlCuPb, AlCuMg2, AlMgMn0.3	41CrMo4	X155CrVMoV51 (G)X40CrMoV51	X5CrNiMo18 10, X5CrNi18 10	NiCr19NbMo, NiCr19Co14Mo4Ti,	

MATRIX
M42
THE MORSE ACHIEVER®
CHALLENGER®
INDEPENDENCE II®
INDEPENDENCE EXS®

MORSE CARBIDE TIPPED BAND SAW BLADE APPLICATIONS

Selection Based Upon Target Application

	CARBON STEELS	ALUMINUM & LT. ALLOY STEELS	ALLOY STEELS MOLD STEELS	TOOL STEELS	STAINLESS STEELS	NICKEL BASE ALLOYS	TITANIUM ALLOYS	CASE HARDENED	ALUMINUM CASTINGS	ABRASIVE WOODS	COMPOSITES	GRAPHITE
AISI	1010, 1020, 1045	6061, 2011 2024, 5052	4140, P20	A2, H13, S7 M-SERIES	316, 304 17-4 PH, 15-5 PH	INCONEL, MONEL, WASPALLOY	T1-6Al-4V					
JIS	S20C, S4SC	6061, 2011, 2024, 5052	SCM 440(H), SCM 445(H)	SHD11, SHD12, SKD61, SKS41	SUS316, SUS304	NCuP-O	H4650, H4600					
DIN	Ck45, C16.8	AlCuPb, AlCuMg2, AlMgMn0.3	41CrMo4	X155CrVMoV51 (G)X40CrMoV51	X5CrNiMo18 10, X5CrNi18 10	NiCr19NbMo, NiCr19Co14Mo4Ti,						

M-FACTOR BY MORSE® – GP
M-FACTOR – EXOTIC
M-FACTOR CH
M-FACTOR – FB/FBS

NEW

MORSE CARBIDE GRIT BAND SAW BLADE APPLICATIONS

Selection Based Upon Target Application

CAST IRON HARDENED STEEL	CERAMICS FOAMED GLASS	FIBERGLASS	CABLE WIRE ROPE	CEMENT CONCRETE	TIRES & WIRE REINFORCED RUBBER	GRAPHITE	COMPOSITES

CARBIDE GRIT

SPARC™

SPARC™ technology is an arc that is ground into the back edge of the blade. The arched profile effectively boosts tooth penetration and chip formation without having to increase machine pressure.

The patent pending profile design is already optimized to work on any size cut, so there is no need to order based upon a particular type of cutting such as light, medium or aggressive – all three cutting actions are achieved with one saw blade

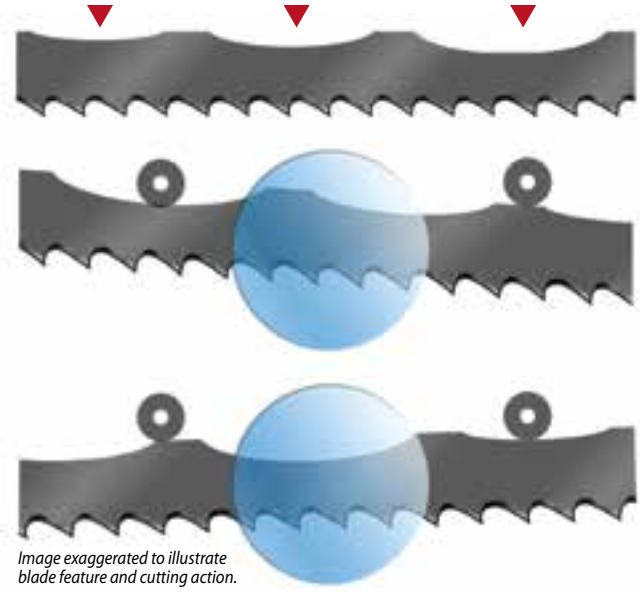


Image exaggerated to illustrate blade feature and cutting action.

KEY APPLICATIONS

- High alloy materials
- Case-hardened materials
- Stainless steel
- Work-hardening applications
- Production cutting tool steels
- D2

While cutting, the alternating pattern of straight and arched profiles on the back edge of the blade produces a rocking motion on the cutting edge of the saw.

This arching motion is the same as adjusting the angle of a handheld hacksaw that is alternately angled up and down to produce a quicker cutting action.

ADVANTAGES TO USERS

Up to 40% Faster Cutting
SParc™ alternately reduces the number of teeth in the cut via an arching motion on the saw blade and with less teeth in the cut at the same feed pressure means greater penetration into the workpiece.

Up to 50% Longer Life is possible when compared to stock **Carbide Tip Blades.**

Up to 40% Longer Life is possible when compared to stock **Bi-Metal Blades.** While some teeth have increased penetration other teeth have less, or no pressure in the workpiece enabling longer *"in-square"* cutting.

THE BEST MORSE BLADES USED WITH MORSE SPARC

- M-Factor by Morse® CT
- The Morse Achiever®
- Independence® II
- Independence® EXS
- M42

Morse Band Saw Feed Rate Monitor

Provides real time, accurate feed rate of the band saw blade through the material being cut. Shows irregular or erratic machine feed which can indicate mechanical / hydraulic problems with the machine

Model:
FEEDRATEMONITOR
Part number: 005012

FEED RATE MONITOR FEATURES

- Compact design
- Professionally calibrated
- Internal magnets for ease of attachment to machine head
- Displays accurate machine feed rates on LCD display
- Feed Rate shown in both inches / minute and millimeters / minute
- Heavy duty protective storage case fitted to secure monitor
- AC or battery operation
- Made in U.S.A.

BENEFITS OF ACCURATE FEED RATE MONITORING:

Optimal blade operation to produce:

- Increased production rate
- Maximize blade life
- Assist in machine problem diagnosis

Morse Band Saw Tension Gauge

Allows you to quickly check for under-tensioned or over-tensioned blade conditions while the blade is on the machine.

TENSION GAUGE FEATURES

- Durable cast/powder coated body
- Calibrated gauge measures in lbs/in^2 as well as kg's/cm^2
- Quality storage box with protective foam inserts

BENEFITS OF PROPER BLADE TENSION:

- Optimal blade life
- Precise cutting results
- Reduces the occurrence of machine damage due to blade over-tensioning

Model number: TENSIONGAUGE
Part number: 005005

M-Factor by Morse® EX (Exotics)

Specially designed for alloy steel and stainless steel applications for exceptional long life.

APPLICATIONS
- Difficult alloy steels
- All stainless steels
- Inconel
- Hastelloy

USERS
- Steel service centers
- Forging operations
- General manufacturing

M-Factor by Morse – EX Exotics

Width x Thickness		Teeth Per Inch			
Inches	mm	.75/1	1.5/2	2/3	3/4
1-1/4 x .042	34 x 1.07		▼	▼	▼
1-1/2 x .050	41 x 1.30	NEW	▼	▼	▼
2 x .050	54 x 1.30		▼	▼	
2 x .063	54 x 1.60		▼	▼	
2-5/8 x .063	67 x 1.60	▼	▼		
3 x .063	80 x 1.60	▼	▼		

NEW

M-Factor by Morse® GP (General Purpose)

Specially designed for alloy steel and stainless steel applications for exceptional long life.

APPLICATIONS
- Alloy steels
- Stainless steels (lower grades)

USERS
- Steel service centers
- Forging operations
- General manufacturing

M-Factor by Morse – GP General Purpose

Width x Thickness		Teeth Per Inch			
Inches	mm	.75/1	1.5/2	2/3	3/4
1 x .035	27 x 0.90			▼	▼
1-1/4 x .042	34 x 1.07	▼	▼	▼	▼
1-1/2 x .050	41 x 1.30		▼	▼	▼
2 x .063	54 x 1.60	▼	▼	▼	
2-5/8 x .063	67 x 1.60	▼	▼	▼	
3 x .063	80 x 1.60	▼	▼		

M-Factor by Morse® CH (Case Hardened)

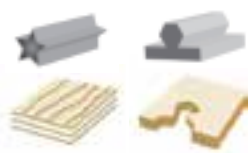
Designed for long life and fast, smooth cutting of chrome plated, case hardened hydraulic shaft specifications.

APPLICATIONS
- Hydraulic shafts
- Case hardened shafts & shapes
- Heat treated thick wall tubing

USERS
- Steel service centers
- Automotive parts makers
- Cylinder manufacturers
- Bearing manufacturers

M-Factor by Morse – CH Case Hardened

Width x Thickness		Teeth Per Inch			
Inches	mm	1.5/2	2/3	3	3/4
1 x .035	27 x 0.90			▼	▼
1-1/4 x .042	34 x 1.07			▼	▼
1-1/2 x .050	41 x 1.30	▼	▼		▼
2 x .063	54 x 1.60	▼	▼		



NEW

M-Factor by Morse® FB & *FBS* (Foundry Band)

Exceptional long life and fast cutting of abrasive and non-ferrous materials. Foundry blades available in Triple Chip and **Set Tooth (FBS).** NEW

APPLICATIONS
- Aluminum castings: gates, risers, extrusions
- Abrasive woods plywood

USERS
- Aluminum foundries
- Graphite manufacturers
- Furniture makers

M-Factor by Morse – FB/FBS Aluminum Foundry

Width x Thickness		Teeth Per Inch	
Inches	mm	3	3 Set NEW
1/2 x .025	12.7 x 0.60	▼	
3/4 x .035	19 x 0.90	▼	▼
1 x .035	27 x 0.90	▼	▼
1-1/4 x .042	34 x 1.07	▼	▼

Independence II® High Production Bi-Metal Blades

Highly fatigue resistant to eliminate premature breakage. Excellent in solid tool steels and small to medium stainless & nickel based alloys.

BLADE FEATURES

- Special high speed steel tooth edges
- Special alloy steel backer
- Unique tooth geometry
- Superior wear, heat and shock resistance
- Fewer blade changes in a wide range of materials equals less downtime

APPLICATIONS

- High production cutting
- Solids of tool steel A2, D2, S7
- Small to medium solids of stainless (304, 316, 17-4)
- Nickel based alloys Inconel, Monel
- All machinable metals in single pieces or bundles

Width x Thickness		Teeth Per Inch			
Inches	mm	2/3	3/4	4/6	5/7
		Variable			
1 x .035	27 x .90	▼	▼	▼	▼
1-1/4 x .042	34 x 1.07	▼	▼	▼	▼
1-1/2 x .050	41 x 1.27	▼	▼	▼	▼
2 x .063	54 x 1.60	▼	▼	▼	▼

Independence EXS® High Production Bi-Metal Blades

Longer lasting than competitive blades and more wear resistant than The Morse Achiever®, and M42, these blades are the best choice for cutting exotics, stainless steels and large solids.

Made In USA

APPLICATIONS

- High production cutting
- Large solids
- Stainless steels
- Exotics

Width x Thickness		Teeth Per Inch				
Inches	mm	1/1.5	1.5/2	2/3	3/4	4/6
		Variable				
1 x .035	27 x .90			▼	▼	▼
1-1/4 x .042	34 x 1.07			▼	▼	▼
1-1/2 x .050	41 x 1.27	▼	▼	▼	▼	
2 x .063	54 x 1.60	▼	▼	▼	▼	

The Morse Achiever®
Production Bi-Metal Blades

Consistently reliable with excellent durability in mild to difficult materials – layer & bundle cuts and large profiles & solids.

APPLICATIONS

- Production cutting
- Material range from carbon to stainless steel
- Layer & bundle cuts:
  1018, 4140, 4340
  tool steels
  stainless steels
- Large profiles & solids
  carbon steels
  alloy tool steel
  stainless steel

THE MORSE ACHIEVER®

BLADE FEATURES

- Best performance in a wide range of materials
- M. K. Morse proprietary edge wire
- M. K. Morse engineered spring steel backer - additional rigidity
- Consistent reliability / performance from blade to blade
- Exceptional tooth durability and fatigue resistance

The Morse Achiever®

Width x Thickness		Teeth Per Inch											
Inches	mm	.75/1.1	1.1/1.5	1.5/2.0	1.4/2.5	2/3	3/4	4/6	5/7	5/8	6/10	8/12	10/14
Variable Pitch - 0° Rake													
NEW 3/4 x .035	19 x .90							▼		▼	▼	▼	▼
1 x .035	27 x .90							▼		▼	▼	▼	▼
1-1/4 x .042	34 x 1.07						▼	▼			▼		
1-1/2 x .050	41 x 1.27					▼	▼						
Variable Pitch - Positive Rake													
1 x .035	27 x .90					▼	▼▼	▼▼	▼				
1-1/4 x .042	34 x 1.07				▼	▼	▼▼	▼▼	▼				
1-1/2 x .050	41 x 1.27				▼	▼▼	▼▼▼	▼▼▼					
2 x .063	54 x 1.60				▼	▼▼	▼▼						
2-5/8 x .063	67 x 1.60	▼	▼	▼		▼	▼						
3 x .063	80 x 1.60	▼	▼	▼									

▼ *Heavy Set* ▼ *Available in 6° Positive Rake*

Challenger® Bi-Metal Structural Blades

Long life and straight cuts in structural material cutting applications while reducing noise and vibration.

BLADE FEATURES

- Special tooth profile for cutting structural materials
- Increased beam strength
- Less noise and vibration
- Less tooth strippage
- Longer life in interrupted cuts
- Straighter interrupted and bundle cuts

APPLICATIONS

- Specially designed for structural applications
- Bundle cuts
- Interrupted cuts
- I-beams
- Low alloy steels
- Carbon steels A36

Challenger® Blades

Width x Thickness		Teeth Per Inch				
Inches	mm	2/3	3/4	4/6	5/7	8/11
1/2 x .025	12.7 x .64					▼
3/4 x .035	19 x .90				▼	▼
1 x .035	27 x .90		▼	▼	▼	▼
1-1/4 x .042	32 x 1.1	▼▼	▼▼	▼▼	▼	▼
1-1/2 x .050	41 x 1.3	▼▼	▼▼	▼▼	▼	▼
2 x .063	54 x 1.6	▼▼	▼▼	▼▼		
2-5/8 x .063	67 x 1.6	▼▼	▼▼	▼▼		

▼ *Heavy Set*

M42 Production Bi-Metal Blades

Durability for higher production speeds on difficult to machine solids and heavy walled structures

APPLICATIONS

- Solids
- Heavy walled structures
- Carbon steels
- Alloy steels
- Some stainless steels
- Medium to heavy production machines

Variable Pitch - Positive Rake

Width x Thickness Inches	Width x Thickness mm	Teeth Per Inch 1.4/2.5	2/3	3/4	4/6	5/7	8/11
		Variable					
1/2 x .025	12.7 x .64						▼
3/4 x .035	19 x .90				▼	▼	
1 x .035	27 x .90		▼	▼▼	▼▼	▼	
1-1/4 x .042	34 x 1.07		▼	▼▼	▼▼	▼	
1-1/2 x .050	41 x 1.27	▼	▼	▼▼	▼▼		
2 x .050	54 x 1.27		▼	▼			
2 x .063	54 x 1.60	▼	▼	▼			

▼ *Available with 6º rake angle*

Variable Pitch - 0˚ Rake

Width x Thickness Inches	Width x Thickness mm	Teeth Per Inch 2/3	3/4	4/6	5/8	6/10	8/12	10/14
		Variable						
1/4 x .025	6.4 x .64							▼
1/4 x .035	6.4 x .90							▼
3/8 x .035	9.5 x .90							▼
1/2 x .025	12.7 x .64						▼	
1/2 x .035	12.7 x .90							▼
3/4 x .035	19 x .90			▼	▼	▼	▼	▼
1 x .035	27 x .90	▼	▼	▼	▼	▼	▼	▼
1-1/4 x .042	34 x 1.07	▼	▼	▼	▼		▼	
1-1/2 x .050	41 x 1.27	▼	▼	▼	▼			

Straight Pitch

Width x Thickness Inches	Width x Thickness mm	Teeth Per Inch 4	6	8	10	14	10	1	1.14	2	3	4	6
		Raker					Wavy	Hook					
1/4 x .035	6.4 x .90				▼	▼							
3/8 x .035	9.5 x .90				▼							▼	
1/2 x .025	12.7 x .64												▼
1/2 x .035	12.7 x .90				▼	▼						▼	▼
3/4 x .035	19 x .90										▼		
1 x .035	27 x .90	▼	▼	▼			▼			▼	▼		
1-1/4 x .042	34 x 1.07	▼							▼	▼	▼	▼	
1-1/2 x .050	41 x 1.27									▼			
2 x .050	54 x 1.27							▼					
2 x .063	54 x 1.60							▼					

Straight Pitch teeth are most often used when the cross sectional size range is consistent.

Matrix II General Purpose Bi-Metal Blades

General purpose blades ideal for cutting materials with easy to moderate machinability. Matrix II bi-metal band saw blades offer good value in maintenance shops and small fabricating shops.

Variable Pitch-Positive Rake

Width x Thickness		Teeth Per Inch		
Inches	mm	2/3	3/4	4/6
		Variable		
3/4 x .035	19 x .90		▼	▼
1 x .035	27 x .90		▼	▼▼
1-1/4 x .042	34 x 1.07		▼	▼
1-1/2 x .050	41 x 1.27	▼	▼	▼

▼ *Heavy Set*

Variable Pitch - 0˚ Rake

Width x Thickness		Teeth Per Inch						
Inches	mm	4/6	5/8	6/10	8/12	10/14	14/18	20/24
		Variable						
3/8 x .025	9.5 x .64					▼		
1/2 x .020	12.7 x .50					▼	▼	▼
1/2 x .025	12.7 x .64			▼	▼	▼	▼	
1/2 x .035	12.7 x .90			▼		▼		
5/8 x .035	16 x .90		▼	▼		▼		
3/4 x .035	19 x .90			▼	▼	▼		
1 x .035	27 x .90	▼	▼	▼	▼	▼		
1-1/4 x .042	34 x 1.07		▼	▼				
1-1/2 x .050	41 x 1.27		▼					

Variable Pitch teeth can handle a wider range of application sizes and reduce sawing harmonics for quieter, reduced vibration cutting.

Specifications - Straight Pitch

Width x Thickness		Teeth Per Inch												
Inches	mm	6	8	10	12	14	18	14	18	24	1.14	3	4	6
		Raker						Wavy			Hook			
3/8 x .025	9.5 x .64		▼	▼		▼							▼	
1/2 x .020	12.7 x .50			▼		▼	▼	▼	▼	▼				
1/2 x .025	12.7 x .64	▼		▼		▼	▼					▼	▼	
1/2 x .035	12.7 x .90												▼	
3/4 x .035	19 x .90	▼	▼	▼	▼	▼						▼		
1 x .035	27 x .90	▼	▼	▼		▼						▼		
1-1/4 x .042	34 x 1.07	▼									▼			

Straight Pitch teeth are most often used when the cross sectional size range is consistent.

APPLICATIONS

- Carbon steels
- Structural steels – A36
  Single piece
  Bundles
  Stacked pieces
- Interrupted cuts of:
  Pipe & tubing
  Angle & channel
- Small & medium band saw machines

BLADE FEATURES

- Variable pitch teeth handle a wide range of application sizes
- Good general purpose metal cutting blade
- Reduced sawing harmonics – quieter, less vibration
- Moderate cost-per-blade low cost-per-cut

Bi-Metal Die Band Blades

Designed for cutting solids with very low machinability including the toughest machinable materials. Production cutting with fewer blade changes for tool and die shops.

APPLICATIONS

- Tool & die shops
- Die blocks
- Tool steels
- "D" grade steels
- "Super" alloys
- Inconel
- Waspalloy
- Hastelloy
- Tough materials
- Typically used on vertical machines

BLADE FEATURES

- Low cost-per-cut
- High heat and wear resistance
- Available in Matrix II and M42 specifications
- Wide selection of blade type and tooth sizes
- Made with either straight pitch or variable pitch teeth
- Matrix II die bands, with high shock resistance, are better suited for thinner sections
- M42 die bands offer high wear and heat resistance and are best suited for cutting difficult-to-machine tool steel and die blocks

MINIMUM RADIUS

- To find minimum radius cut for each blade width see chart on page 19.

M42 Specifications

Width x Thickness		Teeth Per Inch						
Inches	mm	10	14	4	6	8/11	8/12	10/14
		Raker		Hook		Variable		
1/4 x .025	6.4 x .64		▼		▼			▼
1/4 x .035	6.4 x .90	▼	▼					▼
3/8 x .035	9.5 x .90	▼		▼				▼
1/2 x .025	12.7 x .64				▼	▼	▼	
1/2 x .035	12.7 x .90	▼	▼	▼	▼	▼		▼

Matrix II Specifications

Width x Thickness		Teeth Per Inch											
Inches	mm	6	8	10	14	18	3	4	6	6/10	8/12	10/14	14/18
		Raker					Hook			Variable			
3/8 x .025	9.5 x .64		▼	▼	▼			▼				▼	
1/2 x .025	12.7 x .64	▼		▼	▼	▼	▼	▼		▼	▼	▼	▼
1/2 x .035	12.7 x .90							▼		▼		▼	

Tungsten Carbide Grit Blades

Ideal for cutting ceramics and other materials that are too hard or abrasive for standard bi-metal blades, tungsten carbide grit blades provide superior wear resistance.

BLADE FEATURES

- Very smooth finish
- Reversible to extend service life
- Available in continuous and gulleted cutting edges
- Continuous grit for brittle materials, or materials thinner than 1/4″ (6.4mm) with surfaces that chip
- Gulleted grit for 1/4″ and larger wall thickness
- Available in medium to coarse grit
- Medium grit for thin materials or fine finishes
- Coarse grit for cutting thick materials

APPLICATIONS

- Fiberglass
- Ceramics
- Cast iron
- Graphite
- Tires & wire reinforced rubber
- Cable & wire rope
- Brittle materials or surfaces that chip

Carbide Grit (Continuous)

Width x Thickness		Grit Size	
Inches	mm	Medium	Coarse
1/4 x .020	6.4 x .50	▼	
1/2 x .025	12.7 x .64	▼	
1 x .035	27 x .90	▼	▼

Carbide Grit (Gulleted)

Width x Thickness		Grit Size		
Inches	mm	Medium	Medium Coarse	Coarse
3/8 x .025	9.5 x .64	▼	▼	
1/2 x .025	12.7 x .64	▼	▼	
3/4 x .032	19 x .80		▼	▼
1 x .035	27 x .90		▼	▼
1-1/4 x .042	34 x 1.07			▼

QUIKSILVER®

NEW

BLADES FOR WOOD PRODUCTION & MAINTENANCE CUTTING

The charts on this page provide a general overview of the types of M. K. Morse band saw blades best suited to a variety of different wood and general / maintenance cutting applications. There are factors such as the type of saw in use and the specific goals of the cutting process which also come into play when choosing a blade. Contact a Morse technical advisor for your specific needs.

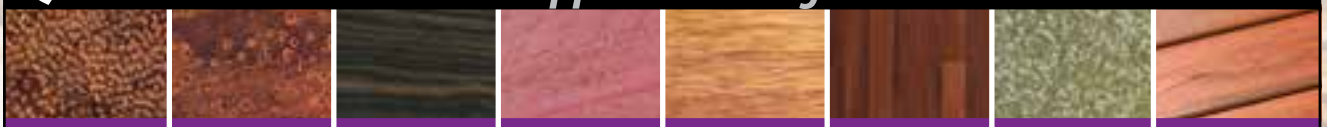
QUIK SILVER® CARBIDE TIPED BAND SAW BLADE APPLICATIONS

Selection Based Upon Target Application

PRODUCTION WOOD CUTTING	HARDWOOD FLOORING	MILLWORK	MDF AND/OR CABINET PRODUCTION	MUSICAL TONEWOODS	SPECIALTY WOOD CUTTING EXOTIC HARDWOODS

QUIK SILVER® CT CARBIDE TIPPED

QUIKSILVER® CT *Carbide Tipped Tooth Edge*



TEAK | COCOBOLO | EBONY | PINK IVORY | KOA | LAMINATES | FIBERGLASS | COMPOSITES

QUIK SILVER® BI-METAL BAND SAW BLADE APPLICATIONS

Selection Based Upon Target Application

PRODUCTION WOOD CUTTING	WOOD CUTTING	CARBON STEELS	LOW ALLOY STEELS	NON-FERROUS METALS	NON-METALIC MATERIALS/PLASTIC

QUIK SILVER® B1 & B2 BI-METAL

QUIKSILVER® B *Bi-Metal Cobalt High Speed Steel Tooth Edge*

ASH | MAPLE | CHERRY | BEECH | WALNUT | HICKORY | OAK

QUIK SILVER® CARBON BAND SAW BLADE APPLICATIONS

Selection Based Upon Target Application

PRODUCTION WOOD CUTTING	WOOD CUTTING	CARBON STEELS	LOW ALLOY STEELS	NON-FERROUS METALS	NON-METALIC MATERIALS/PLASTIC

QUIK SILVER® HARD EDGE HARD BACK / HARD EDGE FLEX BACK

QUIKSILVER® CT

NEW

Quik Silver® Carbide Tipped

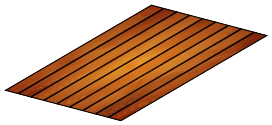
Specially designed for fine-finish wood cutting in applications such as hardwood flooring, millwork and musical tonewoods.

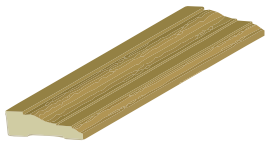
BLADE FEATURES

- Triple chip tooth design for smooth finishes with less sanding
- Carbide tips provide exceptionally long blade life
- Triple chip design allows solutions to cutting the hardest exotic wood species
- Available in straight and variable pitch tooth patterns

APPLICATIONS

- Hardwood flooring
- Millwork
- Musical tonewoods
- MDF
- Other specialty wood cutting





Quik Silver® CT

Width x Thickness		Teeth Per Inch				
Inches	mm	3	.75/1	1.5/2.0	2/3	3/4
		Straight	Variable			
1/2 x .025	12.7 x .64	▼				
3/4 x .035	19 x .90	▼				
1 x .035	27 x .90	▼			▼	▼
1-1/4 x .042	34 x 1.07	▼		▼		
1-1/2 x .050	41 x 1.30			▼		
2 x .042	54 x 1.07		▼			

NEW

QUIKSILVER® B1/B2

Quik Silver® Bi-Metal Wood Blades

Designed for wood and wood based material production cutting. Maintenance shop cutting of low alloy ferrous metals / non-ferrouse metals.

APPLICATIONS

- Vertical and horizontal machines for resaw
- Portable saw mills
- Contour cutting on vertical machines

BLADE FEATURES

- Bi-Metal material provides longer blade life than carbon bands
- High heat and wear resistance for longer life
- Can be resharpened for longer tooth life

Quik Silver® B1

Width x Thickness		Teeth Per Inch																								
Inches	mm	1.4/2.5	4/6	5/8	6/10	8/12	10/14	14/18	20/24	6	8	10	12	14	18	14	18	24	1	1.14	1.3	2	3	4	6
		Variable								Raker						Wavy			Hook						
1/4 x .025	6.4 x .64						▼					▼		▼											▼
3/8 x .025	9.5 x .64						▼				▼	▼		▼										▼	
1/2 x .020	12.7 x .50						▼	▼	▼			▼			▼	▼	▼	▼							
1/2 x .025	12.7 x .64				▼	▼	▼	▼		▼		▼		▼	▼								▼	▼	
1/2 x .035	12.7 x .64				▼		▼																	▼	
5/8 x .035	16 x .90			▼	▼		▼																		
3/4 x .035	19 x .90				▼	▼	▼			▼	▼	▼	▼	▼									▼		
1 x .035	27 x .90		▼	▼	▼	▼	▼			▼	▼	▼		▼									▼		

Quik Silver® B1 Wood Mill

▼ *1.14 Hook = 7/8 Tooth Spacing*

1 1/4 x .042	32 x 1.07			▼	▼					▼										▼					
1 1/2 x .050	39 x 1.27			▼																					

Quik Silver® B2 Wood Mill

1 x .035	27 x .90																				▼	▼			
1 1/4 x .035	32 x .90																					▼	▼		
1 1/4 x .042	32 x 1.07																			▼					
1 1/2 x .050	39 x 1.27	▼																							
2 x .050	51 x 1.27																		▼						

▼ *Heavy Set*

Quik Silver® HEF/HB Wood Mill/Resaw Blades

Versatile blades offer high value in a variety of wood cutting applications. Blades are manufactured from a single piece of high carbon steel with individually hardened tooth tips.

APPLICATIONS

- Portable and stationary wood mills
- Single head and multi-head resaw systems
- Scragg mills

BLADE FEATURES

- Available in both flex back & hard back
- Flex back blades are more fatigue resistant
- Hard back blades offer straighter cuts
- Low cost-per-blade/low cost-per-cut
- Can be resharpened for longer tooth life

Hard Edge Hard Back - (HB)

Width x Thickness		Teeth Per Inch
Inches	mm	1.3
		Hook
1 x .035	27.5 x .9	▼
1-1/4 x .035	32.0 x .9	▼
1-1/4 x .042	32.0 x 1.1	▼

Hard Edge Flex Back - (HEF)

Width x Thickness		Teeth Per Inch			
Inches	mm	1	1.14	1.3	2
		Hook			
1 x .035	27.5 x .9			▼▼	▼
1 x .042	27.5 x 1.1			▼	▼
1-1/4 x .035	32.0 x .9		▼	▼	▼
1-1/4 x .042	32.0 x 1.1	▼	▼▼	▼▼	
1-1/2 x .045	38.1 x 1.1		▼		
2 x .035	50.8 x .9		▼	▼	
2 x .042	50.8 x 1.1		▼		

▼ *Heavy Set* ▼ *Bright Finish*

Quik Silver® Wood Mill Blades

Ideal for wood cutting applications where blade fatigue problems are an increased concern.

APPLICATIONS

- Wood cutting with increased fatigue resistance

Quik Silver Flex Back (WMF) & Hard Back (WMH)

Width x Thickness		Teeth Per Inch			
Inches	mm	1	1.14	1.3	2
		Hook			
1 x .035	27.5 x .9			▼▼	▼▼
1-1/4 x .042	32 x 1.1	▼▼	▼▼▼	▼▼▼	
1-1/2 x .045	38 x 1.1	▼▼	▼▼	▼▼	
2 x .035	51 x .9	▼▼	▼▼	▼▼	
2 x .042	51 x 1.1	▼▼	▼▼	▼▼	
2 x .055	51 x 1.4	▼			

▼ *WMF flexback* ▼ *WMH hardback* ▼ *WMH hardback - light set (.019/side)*

BLADE FEATURES

- Made from a single piece of Quik Silver alloy steel with individually hardened tooth tips
- Available in both flex back & hard back
- Flex back blades are fatigue resistant
- Hard back blades offer straighter cuts
- Low cost-per-blade/low cost-per-cut
- Can be resharpened for longer tooth life

Quik Silver® Pallet Dismantling Blades

Specially designed to withstand the rough service required on dismantling machines while cutting through pallet nails and staples.

APPLICATIONS

- All types of band saw pallet dismantling machines

BLADE FEATURES

- Low cost-per-cut
- Rugged durability
- Available in bi-metal Matrix II and M42 specifications as well as a special grade of carbon steel
- Made with either straight pitch or variable pitch teeth

M42 Bi-Metal

Width x Thickness		Teeth Per Inch	
Inches	mm	5/8	6
		Variable	Raker
1-1/4 x .042	32 x 1.1	▼	▼

Matrix II Bi-Metal

Width x Thickness		Teeth Per Inch		
Inches	mm	6/10	5/8	6
		Variable		Raker
1-1/4 x .042	32 x 1.1	▼	▼	▼

Lower cost blades are available in a special grade of carbon steel to enhance their durability in a variety of dismantling machines.

Carbon Hard Back (HB) Special

Width x Thickness		Teeth Per Inch	
Inches	mm	5/8	6
		Variable	Raker
1-1/4 x .042	32 x 1.1	▼	▼

Quik Silver® (HB) Hardback Blades

Stiffer blades offer straighter cuts in wood & metal cutting. On metals they are used for short production and maintenance applications

BLADE FEATURES

- Manufactured from a single piece of high carbon steel with individually hardened tooth tips
- Low cost-per-blade/low cost-per-cut in wood & similar materials
- In metals; low cost-per-blade/higher cost-per-cut than bi-metal
- Stiffer than hard edge flex (HEF) blades due to a hardened & tempered backer
- Straighter cuts with heavier feed pressure than carbon HEF
- Will accept heavier feed pressure than carbon HEF
- Good on easy-to-machine metals and other easy-to-cut materials
- Not recommended for blade speeds exceeding 4000 sfm

APPLICATIONS

- Low alloy, easy-to-machine ferrous metals
- Non-ferrous metals:
  Brass/copper
  Bronze
  Aluminum
  Lead
- Wood
- Plastic
- Cork
- Composition board
- Plywood

Specifications

Width x Thickness		Teeth Per Inch																				
Inches	mm	6	8	10	14	18	24	10	12	14	18	24	32	1.3	2	3	4	6	3	4	6
		Raker						Wavy						Hook					Skip		
3/16 x .025	4.8 x .64																			▼	
1/4 x .025	6.4 x .64			▼	▼	▼	▼						▼				▼	▼		▼	▼
3/8 x .025	9.5 x .64		▼	▼	▼	▼										▼	▼	▼	▼	▼	
1/2 x .020	12.7 x .50				▼																
1/2 x .025	12.7 x .64	▼	▼	▼	▼	▼	▼	▼		▼	▼	▼				▼	▼	▼		▼	
5/8 x .032	16 x .80		▼	▼	▼												▼				
3/4 x .032	19 x .80	▼	▼	▼	▼	▼		▼	▼	▼	▼				▼▼	▼		▼	▼	▼	
1 x .035	27 x .90	▼	▼	▼	▼									▼	▼	▼	▼				
1 x .042	27 x 1.1													▼							
1 1/4 x .035	32 x .90													▼							
1 1/4 x .042	32 x 1.1	▼												▼							

▼ *Standard Set* ▼ *Heavy Set* ▼ *D-Double Set Raker*

APPLICATIONS

- Wood
- Plastic
- Cork
- Composition board
- Plywood
- Aluminum
- Non-ferrous metals
- Low alloy steel

Quik Silver® (HEF) Flexback Blades

Ideal for wood production cutting and short production/ maintenance/general purpose applications using low alloy steel & non-ferrous metals

BLADE FEATURES

- Manufactured from a single piece of high carbon steel with individually hardened tooth tips
- More fatigue resistant than Carbon hard back
- Low cost-per-blade/low cost-per-cut in wood
- Low cost-per-blade/higher cost-per-cut in tougher materials
- Can be run at speeds up to 15,000 sfm

Specifications

Width x Thickness		Teeth Per Inch																					
Inches	mm	4	6	8	10	14	18	24	10	14	18	24	32	1	1.14	1.3	2	3	4	6	3	4	6
		Raker							Wavy					Hook							Skip		
1/8 x .025	3 x .64					▼	▼																
3/16 x .025	4.8 x .64				▼	▼																▼	
1/4 x .014	6.4 x .30					▼	▼					▼											▼
1/4 x .020	6.4 x .50																						▼
1/4 x .025	6.4 x .64			▼	▼	▼	▼	▼					▼						▼	▼		▼	▼
3/8 x .014	9.5 x .30					▼						▼	▼										▼
3/8 x .025	9.5 x .64			▼	▼	▼	▼	▼										▼	▼	▼	▼	▼	
3/8 x .032	9.5 x .80																▼▼						
1/2 x .020	12.7 x .50		▼		▼					▼	▼	▼						▼					
1/2 x .025	12.7 x .64	▼	▼	▼	▼	▼	▼	▼		▼	▼	▼	▼					▼	▼▼	▼▼	▼	▼	
5/8 x .032	16 x .80				▼	▼	▼		▼	▼								▼	▼	▼			
3/4 x .032	19 x .80		▼	▼	▼	▼	▼			▼							▼	▼	▼	▼	▼	▼	
3/4 x .050	19 x 1.30																▼	▼					
1 x .035	27 x .90		▼	▼	▼	▼										▼	▼▼	▼	▼	▼	▼		
1 x .035 *Bright	27 x .90															▼							
1 x .042	27 x 1.07															▼							
1 x .042 *Bright	27 x 1.07															▼							
1 1/4 x .035	32 x .90														▼	▼	▼						
1 1/4 x .042	32 x 1.07													▼	▼	▼					▼		
1 1/4 x .042 *Bright	32 x 1.07														▼	▼							
1 1/2 x .045	38.1 x 1.14														▼								
2 x .035	50.8 x .90														▼	▼							
2 x .042	50.8 x 1.07													▼	▼								

▼ *Standard Set* ▼ *Heavy Set* ▼ *D-Double Set Raker*

** "Bright" specifications have an unblued, silver surface finish.*

Quik Silver® Carbon Furniture Blades

Ideal for use on large, high-speed vertical cutting band machines used in the furniture industry. Blades offer faster cutting while maintaining precision required in the furniture industry.

BLADE FEATURES

- Special ETS (every tooth set) pattern and aggressive 10º hook tooth design for faster cutting with longer tooth tip life
- Flexible backer resists fatigue but allows contour control required in furniture manufacturing
- Manufactured from a single piece of high carbon steel with individually hardened tooth tips
- Thicker blade is stiffer for more control
- Low cost-per-blade/low cost-per-cut
- Can be resharpened for longer tooth life

APPLICATIONS

- Wood
- Chip board
- Plywood
- Cardboard
- Used on large, vertical, high-speed wood cutting machines

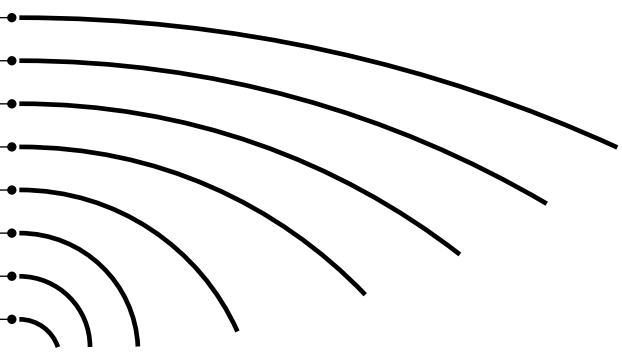
Carbon Furniture Production Blades

Width x Thickness		Teeth Per Inch						
Inches	mm	3	4	6	2	3	4	6
		Hook ETS			Hook Raker Set			
1/4 x .025	6.4 x .64		▼	▼			▼	▼
1/4 x .032	6.4 x .80		▼					
3/8 x .025	9.5 x .64	▼				▼	▼	▼
3/8 x .032	9.5 x .80	▼	▼		▼▼			
1/2 x .025	12.7 x .64	▼	▼			▼	▼▼	▼▼
1/2 x .032	12.7 x .80	▼	▼			▼		
5/8 x .032	16.0 x .80					▼	▼	▼
3/4 x .032	19.0 x .80	▼	▼		▼	▼	▼	▼

▼ *Standard Set* ▼ *ETS Set* ▼ *Heavy Set* ▼ *D-Double Set Raker* ▼ *Special Extra Heavy Set Hard Back*

Minimum radius cut for a given blade width

Blade Width	Minimum Radius	Materials Thickness 1″/25mm
1″/25mm	7-1/4″/184mm	
3/4″/19mm	5-7/16″/138mm	
5/8″/16mm	3-3/4″/95mm	
1/2″/13mm	2-1/2″/63mm	
3/8″/10mm	1-1/4″/32mm	
1/4″/6mm	5/8″/16mm	
3/16″/5mm	3/8″/10mm	
1/8″/3mm	7/32″/5.5mm	



BLADE PART NUMBERS

The M. K. Morse Company has begun using 10-digit numeric band saw blade part numbers rather than alpha-numeric part numbers.

The first 6-digits of the part number identify the material and size specifications. The last 4-digits identify the length of the blade for both weld-to-length bands and coil stock.

The band saw blade part number reference chart below provides the same details we have in-house to configure the new part numbers. Customer Service at M. K. Morse will assist all band saw blade distributors with any cross referencing needed. If you have any questions, please contact your M. K. Morse Customer Service Representative.

1st & 2nd DIGITS — MATERIAL / TOOTH SET STYLE

Part #	Material Type	Set Style
00	M42	Positive, 6° Rake
10	QS HEF Carbon	Hook Raker – Special Extra Heavy Set
11	QS HEF Carbon	Hook – Heavy Set
13	QS HEF Carbon	Hook - Double Set Raker
14	QS HEF Carbon	Wavy
15	QS HEF Carbon	Skip
16	QS HEF Carbon	Raker or Variable Pitch
17	QS HEF Carbon	Quik Silver WMF - Hook
18	QS HEF Carbon	Hook
19	QS HEF Carbon	Hook ETS
20	QS HEF Carbon	Bright
26	QS HB Carbon	Hook – Light Set
30	Matrix II	Positive Rake
31	Matrix II	Positive Rake – Heavy Set
33	Matrix II	0° Rake - Heavy Set
34	Matrix II	Wavy
36	Matrix II	Raker
38	Matrix II	Hook
39	Matrix II	0° Rake
40	M42	Positive Rake
41	The Morse Achiever®	10° Positive Rake
42	M42	0° Rake
43	The Morse Achiever®	0° Rake
44	M42	Wavy
45	M42	Straight Pitch – Heavy Set
46	M42	Raker
47	The Morse Achiever®	Variable – 6° Positive Rake
48	M42	Hook
49	The Morse Achiever®	Heavy Set
51	Independence II®	Heavy Set
55	Independence II®	Variable Pitch
57	Independence EXS®	Variable Pitch
60	QS Hard Back Carbon	Hook Raker – Special Extra Heavy Set
61	QS Hard Back Carbon	Hook – Heavy Set
63	QS Hard Back Carbon	Hook - Double Set Raker
64	QS Hard Back Carbon	Wavy
65	QS Hard Back Carbon	Skip
66	QS Hard Back Carbon	Raker or Variable Pitch
67	QS Hard Back Carbon	Quik Silver WMH - Hook
68	QS Hard Back Carbon	Hook
70	Tun. Carbide Grit - Continuous	Medium
71	Tun. Carbide Grit - Continuous	Medium Coarse
72	Tun. Carbide Grit - Continuous	Coarse
73	Tun. Carbide Grit - Gulleted	Medium
74	Tun. Carbide Grit - Gulleted	Medium Coarse
75	Tun. Carbide Grit - Gulleted	Coarse
80	M-Factor by Morse® - Carbide Tipped	Aluminum Foundry
81	M-Factor by Morse® - Carbide Tipped	Case Hardened
82	M-Factor by Morse® - Carbide Tipped	General Purpose
83	M-Factor by Morse® - Carbide Tipped	Exotic
91	Challenger®	Positive Rake
92	Challenger®	Heavy Set
GA	M-Factor by Morse® - Carbide Tipped	Wood Production

3rd & 4th DIGITS — BLADE WIDTH

Part #	Width x Thickness
10	.25 x .014
11	.375 x .014
20	.25 x .020
21	.50 x .020
30	.125 x .025
31	.1875 x .025
32	.25 x .025
33	.375 x .025
34	.50 x .025
40	.25 x .032
41	.375 x .032
42	.50 x .032
43	.625 x .032
44	.75 x .032
50	.25 x .035
51	.375 x .035
52	.50 x .035
53	.625 x .035
54	.75 x .035
55	1 x .035
56	1.25 x .035
57	2 x .035
60	1 x .042
61	1.25 x .042
62	2 x .042
70	1.25 x .045
71	1.5 x .045
80	.75 x .050
81	1.5 x .050
82	2 x .050
90	2 x .063
91	2.625 x .063
92	3 x .063

5th & 6th DIGITS — TOOTH COUNT

Part #	TPI
00	Carbide Grit
01	1
02	2
03	3
04	4
06	6
08	8
10	10
12	12
13	10 / 14
14	14
16	14 / 18
18	18
22	20 / 24
23	2 / 3
24	24
32	32
34	3 / 4
46	4 / 6
57	5 / 7
58	5 / 8
68	6 / 10
80	8 / 11
81	8 / 12
91	.75 / 1.1
92	1.4 / 2.5
93	1.3
94	1.14
95	1.15
96	1.1 / 1.5
97	1 / 1.5
98	1.5 / 2

7th, 8th & 9th DIGITS — BLADE LENGTH

Number of feet multiplied by **12** plus additional inches.
(Unless using Coil Stock. **Coil Length** (in feet) + **C**)
If a **RANDOM LENGTH** coil - use **000R**.

10th DIGIT — FRACTION OF INCH/MILLIMETER

Part #	Inch Length	Part #	Millimeter Length
0	Even Length	0	Even Length
1	1/8″	1	3
2	1/4″	2	6.4
3	3/8″	3	9.5
4	1/2″	4	12.7
5	5/8″	5	16
6	3/4″	6	19
7	7/8″	7	22
C	Coil Stock	C	Coil Stock

EXAMPLE 1 — PREVIOUS PART #ZWEN635C23HPII

Therefore:	Independence II	2.625 x .063	2/3	100' Coil	
Is shown as:	**51**	**91**	**23**	**100C**	
NEW PART #	**519123100C**				

51 91 23 100C

EXAMPLE 2 — PREVIOUS PART #ZWEFH02M42HS

Therefore:	M42 Straight Pitch Heavy Set	3/4 x .035	2	35' 8-1/2"	For 1/2" aka 4/8", thus 4
Is shown as:	**45**	**54**	**02**	**428**	**4**
NEW PART #	**4554024284**			(35 x 12 = 420) (420 + 8 = 428)	

7th, 8th & 9th DIGITS — METRIC BAND LENGTH

Number of millimeters multiplied by **.03937** equals total number of inches. (Unless using Coil Stock. **Coil Length** (in feet) + **C**)
If a **RANDOM LENGTH** coil - use **000R**.

Warning About Saw Blade Usage

CUTTING TOOLS CAN SHATTER AND/OR BREAK UNDER IMPROPER OR SEVERE USE. WEAR SAFETY EQUIPMENT, AND PARTICULARLY GOGGLES, GLOVES AND HEARING PROTECTION, AT ALL TIMES IN THE VICINITY OF THEIR USE. ALWAYS FOLLOW BAND SAW MACHINE MANUFACTURERS' RECOMMENDATIONS.

The M. K. Morse Company Warranty

The M. K. Morse Company warrants each new product manufactured and sold by it or one of its authorized distributors only against defects in workmanship and/or materials under normal service, proper installation and use. THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF VERIFIED DEFECTIVE PRODUCTS AND EXCLUDES ANY AND ALL IMPLIED WARRANTY OF MERCHANTABILITY AND ALL RISK AND LIABILITY WHATSOEVER RESULTING FROM ANY USE OF SAID PRODUCTS, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGES. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE THEREOF. The provisions of this warranty and limitation of liability shall not be modified in any respect except by written document signed by an officer of The M. K. Morse Company.

Guaranteed Trial Band Saw Blades

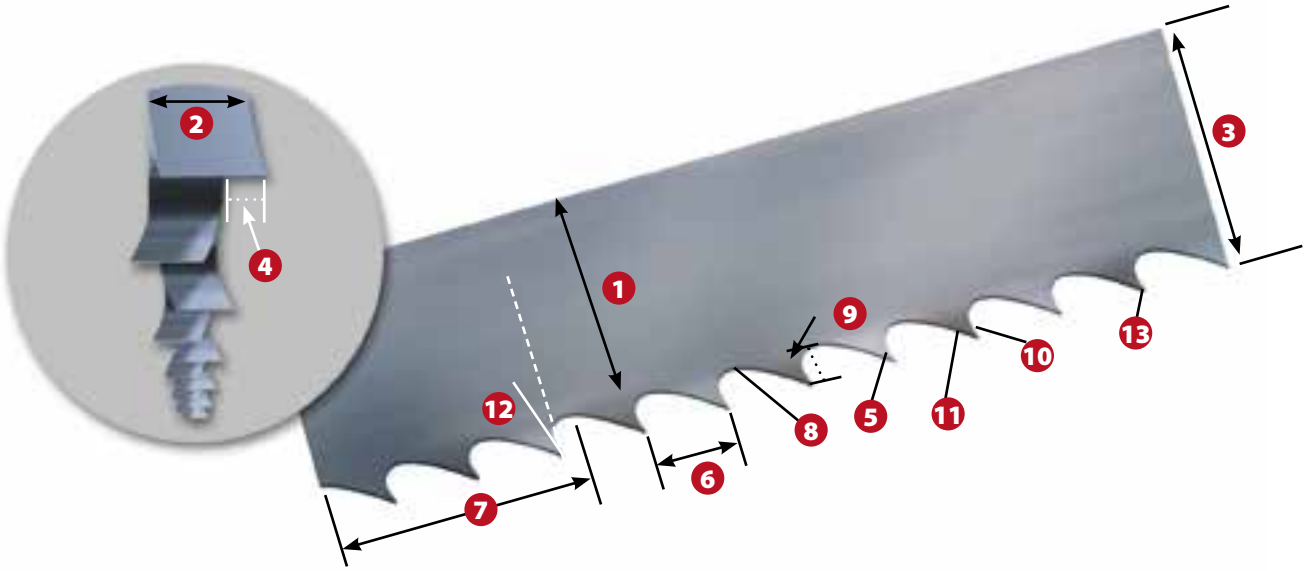
The M. K. Morse Company will provide bi-metal and carbon weld-to-length blades as a "Guaranteed Trial Order" (GTO) for the purpose of user evaluation of performance. If the blade recommended by Morse or approved by Morse for the particular application, fails to perform satisfactorily for the user, Morse will issue a full credit for the invoice value of the blade upon the return of the blade to Morse.

In all instances where Morse provides bi-metal and carbon welded-to-length band saw blades for trial and evaluation, the Morse sales representative will provide follow-up.

Morse is confident in the ability of our blades to meet the end users expectations for performance.

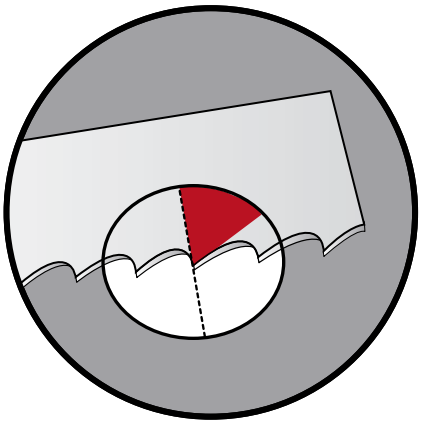
Anatomy of a Saw Blade

Although it looks like a flat piece of metal with teeth, a quality industrial band saw blade is actually a sophisticated cutting tool. Its ability to efficiently cut through tough metals, composite materials, plastics, and woods depends on a variety of interrelated factors such as the design, spacing and set of the teeth; the design and capacity of the gullets to make sure chips are efficiently removed; the composition of the backer strip; and the gage of the metal. These considerations must be taken into account when selecting the right blade for your application. The following Technical Pages will help you arrive at the perfect Morse solution to your particular cutting problem.

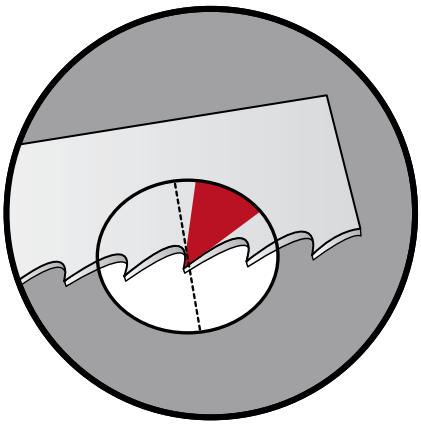


1. **Blade Back** ..... The body of the blade not including tooth portion
2. **Gage** ..... The thickness of the blade
3. **Width** ..... The tip of tooth to back of blade
4. **Set** ..... The bending of teeth right or left
5. **Tooth** ..... The cutting portion of the saw blade
6. **Tooth Pitch** ..... The distance from one tooth tip to the next
7. **T.P.I.** ..... The number of teeth per inch measured gullet to gullet
8. **Gullet** ..... The curved area between the tooth points
9. **Gullet Depth** ..... The distance from the tooth tip to the bottom of the gullet
10. **Tooth Face** ..... The surface of the tooth on which the chip is formed
11. **Tooth Flank** ..... The angled back surface of the tooth opposite the tooth face
12. **Tooth Rake Angle** .... The angle of the tooth face measured with respect to a line perpendicular to the cutting direction of the saw
13. **Tooth Tip** ..... The cutting edge of the saw tooth

TOOTH SET SPECIFICATIONS



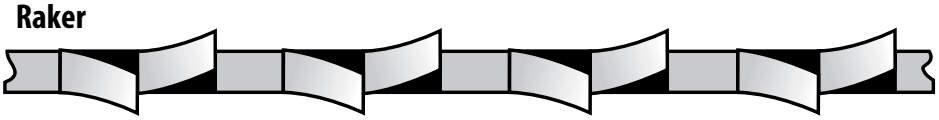
Standard (0º Rake)



Hook (Positive Rake)

Here's where the blade makes the cut. The tooth design variables include shape, position, set, type and spacing. The combination of these variables will determine whether the blade can move easily through your material without binding or becoming clogged with chips.

Raker

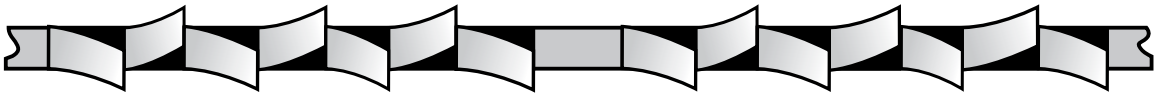


Recurring sequence of teeth - one set right, one set left, and one unset.

Modified Raker (double set raker)

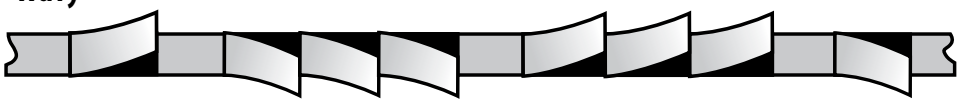
Recurring sequence set left, right, left, right, straight tooth pattern.

Variable Pitch Modified Raker (D-Double set raker)



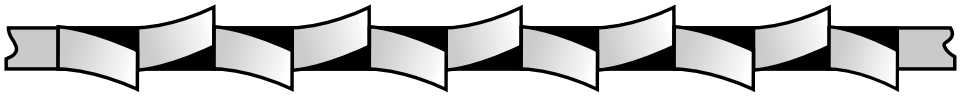
Set sequence depends on the number of teeth in the variable pitch tooth pattern.
Recurring sequence with more than two set teeth before an unset tooth.

Wavy



Groups of teeth, usually 3 or 4, set to each side in a controlled pattern with an unset tooth between groups.

Alternate (ETS)



Every tooth set alternately to the left and right.

Band Saw Tooth Pitches

Variable Pitch

- **Varying gullet depth**
- **0˚ Rake angle**
- **Variable tooth spacing**

Advantages
- Excellent chip carrying capacity
- Reduces harmonic vibration

Benefits
- Improves blade life
- Reduces noise
- Cuts smoother & more efficiently

Variable Pitch Positive Rake

- **Varying gullet depth**
- **Variable tooth spacing**
- **Positive rake angle**

Advantages
- Better chip formation
- Excellent chip carrying capacity
- Reduces harmonic vibration
- More aggressive cutting

Benefits
- Cuts smoother, cuts faster
- Wide range of applications
- Reduces noise
- Easier chip generation

Standard Raker

- **Equally spaced teeth**
- **0˚ Rake angle**

Advantages
- Excellent chip carrying capacity

Benefits
- General purpose

Skip

- **Wide flat gullets**
- **0˚ Rake angle**
- **Equally spaced teeth**

Advantages
- Excellent chip carrying capacity
- Provide coarse pitch on narrow bands
- Flat gullets

Benefits
- Excellent cutting for non-metallic & non-ferrous applications, (wood, plastic, brass, copper, bronze & aluminum)
- Help break “stringy” chips

Hook

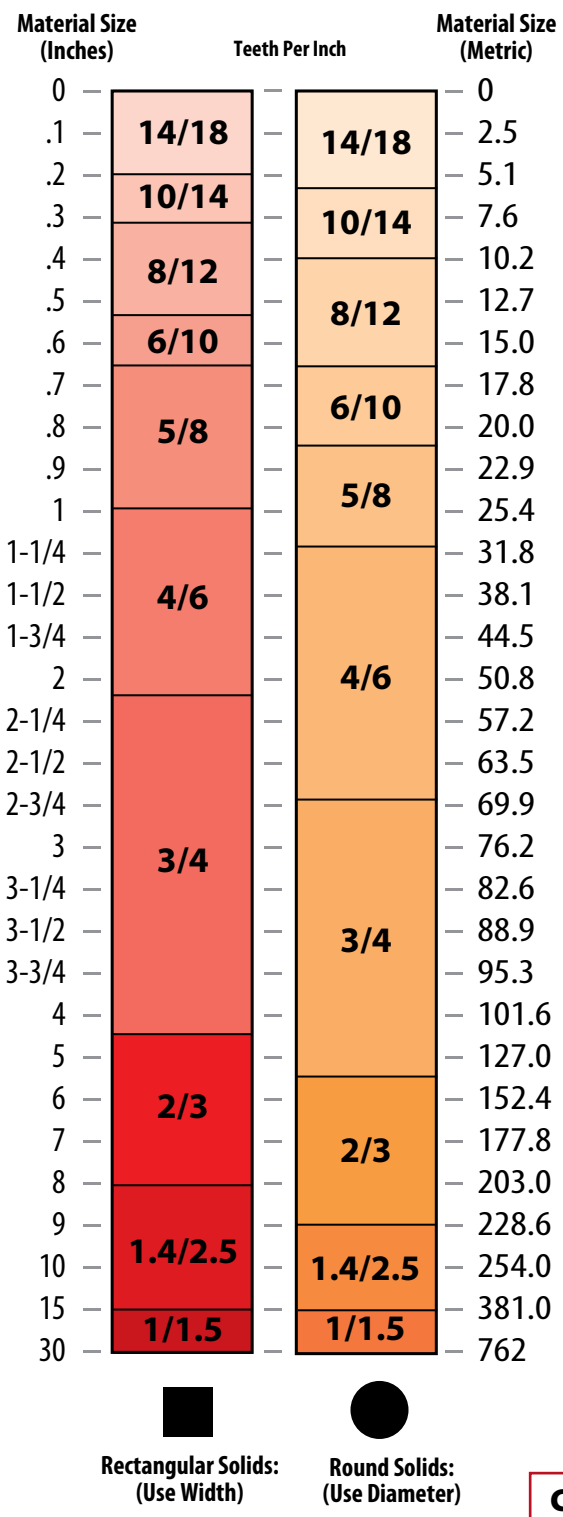
- **Wide rounded gullets**
- **Equally spaced teeth**
- **Positive rake angle**

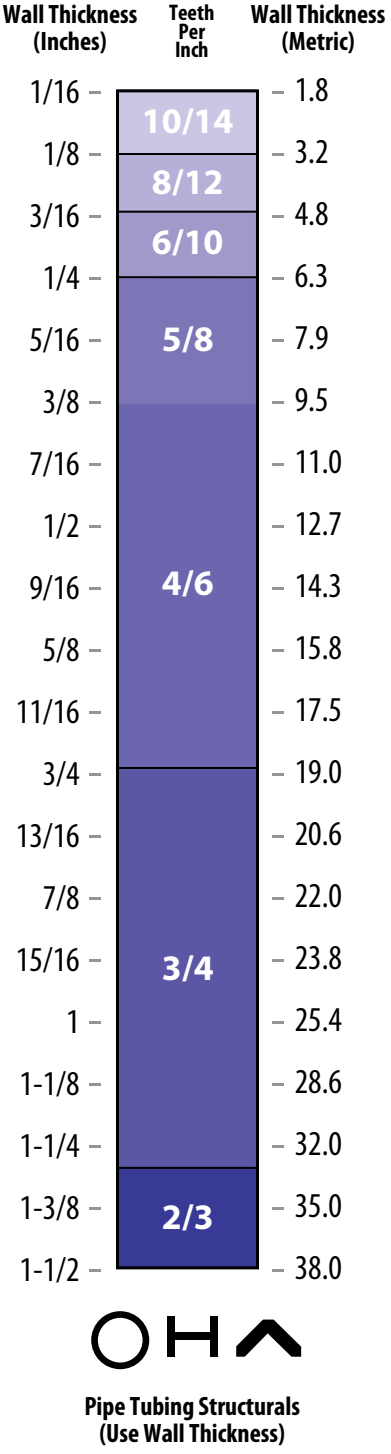
Advantages
- Excellent chip carrying in non-metallic applications
- Positive rake provides better tip penetration with less feed pressure

Benefits
- Good cutting performance in discontinuous chip forming materials (cast iron)
- Fast cutting with good surface finish

Tooth Selection Guide (teeth per inch)

Band saw tooth size (Teeth Per Inch) is determined by the size and type of material to be cut and the desired finish. To select T.P.I. using this chart, find the colored chart for the type of material you wish to cut. Move up to the correct material size next to the chart. Follow across to the chart for the appropriate T.P.I. for your blade.





Cutting speed - structurals rule of thumb:
When cutting structurals use a cutting speed of
250-325 S.F.M. Wet • 200-250 S.F.M. Dry

BLADE SPEED/REMOVAL RATES

For use with Bi-Metal Blades*

Stock Dimensions Tooth Pitch	Up to 2" 5-8, 4-6, 3-4		From 2" - 4" 4-6, 3-4		From 4" - 6" 3-4, 2-3, 3 Sabre		From 6" - 10" 1.4-1.8, 1.5-1.9		From 10" - 12" 1.4-1.8, 1.5-1.9		From 12" - 16" 1.1-1.4, .75-1.25		From 16" - 20" 1.1-1.4, 1-1.3, .75-1.25	
Material (Annealed)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)
Aluminum Alloys:														
2024 - 5052 6061 - 7075	300	10 - 15	300	10 - 15	300	10 - 15	300	10 - 15	300	10 - 15	300	10 - 15	300	10 - 15
Copper Alloys														
CDA 220	250	8 - 12	230	7 - 11	220	7 - 11	210	6 - 10	200	5 - 9	180	4 - 8	150	4 - 8
CDA 360	325	11 - 15	300	10 - 15	290	10 - 15	275	8 - 12	250	7 - 11	225	6 - 10	200	5 - 10
Copper Nickel (30%)	230	7 - 11	220	7 - 11	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 8	120	4 - 8
Beryllium Copper	180	5 - 9	170	5 - 9	160	4 - 8	140	4 - 8	130	3 - 7	120	3 - 7	110	3 - 7
Bronze Alloys														
AMPCO 18	200	5 - 9	180	5 - 9	170	4 - 8	150	4 - 8	140	4 - 8	130	4 - 8	120	3 - 7
AMPCO 21	170	4 - 8	160	4 - 8	150	4 - 8	140	4 - 8	130	3 - 7	120	3 - 7	110	2 - 6
AMPCO 25	120	2 - 6	110	2 - 6	100	2 - 6	100	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5
Leaded Tin Bronze	320	10 - 15	300	10 - 15	280	10 - 15	260	7 - 11	220	5 - 9	200	4 - 8	180	4 - 8
Aluminum Bronze 865	160	6 - 10	150	6 - 10	140	5 - 9	130	4 - 8	120	3 - 7	110	2 - 6	100	2 - 6
Manganese Bronze	230	7 - 11	220	7 - 11	210	6 - 10	190	6 - 10	170	5 - 9	150	4 - 8	140	3 - 7
932	300	10 - 14	290	10 - 14	270	9 - 13	250	6 - 10	220	5 - 9	200	5 - 9	160	4 - 8
937	270	8 - 12	250	8 - 12	240	7 - 11	210	6 - 10	200	5 - 9	180	5 - 9	160	4 - 8
Brass Alloys														
Cartridge / Red Brass (85%)	240	9 - 13	220	8 - 12	210	8 - 12	200	7 - 11	180	6 - 10	160	4 - 10	140	4 - 10
Naval Brass	220	6 - 10	200	6 - 10	190	6 - 10	170	4 - 8	160	4 - 8	140	4 - 8	130	4 - 8
Carbon Steels														
1008, 1013, 1015, 1018	300	11 - 15	280	10 - 14	260	10 - 14	240	8 - 12	220	6 - 10	200	6 - 10	180	4 - 8
1030	270	8 - 12	250	8 - 12	240	7 - 11	210	6 - 10	200	5 - 9	180	5 - 9	160	4 - 8
1035	300	11 - 15	280	10 - 14	260	10 - 14	240	8 - 12	220	6 - 10	200	6 - 10	180	4 - 8
1045, 1048	300	11 - 15	280	10 - 14	260	10 - 14	240	8 - 12	220	6 - 10	200	6 - 10	180	4 - 8
1060, 1065	230	7 - 11	220	7 - 11	210	6 - 10	190	6 - 10	170	5 - 9	150	4 - 8	140	3 - 7
1080	220	7 - 11	210	6 - 10	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 10	130	4 - 10
1095	220	7 - 11	210	6 - 10	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 10	130	4 - 10
Free Machining Steels														
1108, 1111	300	11 - 15	280	10 - 14	260	10 - 14	240	8 - 12	220	6 - 10	200	6 - 10	180	4 - 8
1112, 1113	300	11 - 15	280	10 - 14	260	10 - 14	240	8 - 12	220	6 - 10	200	6 - 10	180	4 - 8
1115, 1137, 1145, 1151	300	11 - 15	280	10 - 14	260	10 - 14	240	8 - 12	220	6 - 10	200	6 - 10	180	4 - 8
1212, 1213	300	11 - 15	280	10 - 14	260	10 - 14	240	8 - 12	220	6 - 10	200	6 - 10	180	4 - 8
1215	350	12 - 16	330	12 - 16	310	12 - 16	290	10 - 14	280	8 - 12	260	8 - 12	240	6 - 10
12L14	380	12 - 16	360	12 - 14	340	12 - 14	320	10 - 14	300	8 - 12	260	8 - 12	230	6 - 10
Structural Steel														
A36	280	10 - 14	260	10 - 14	240	10 - 14	220	8 - 12	200	8 - 12	180	6 - 10	160	6 - 10
Maganese Steels														
1320, 1330, 1345	270	8 - 12	250	8 - 12	240	7 - 11	210	6 - 10	200	5 - 9	180	5 - 9	160	4 - 8
1513, 1524, 1536	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
1541, 1572	220	7 - 11	210	6 - 10	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 10	130	4 - 10
1524	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
Molybdenum Steels														
4017, 4024	270	8 - 12	250	8 - 12	240	7 - 11	210	6 - 10	200	5 - 9	180	5 - 9	160	4 - 8
4032, 4042	270	8 - 12	250	8 - 12	240	7 - 11	210	6 - 10	200	5 - 9	180	5 - 9	160	4 - 8
4047, 4066	220	7 - 11	210	6 - 10	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 10	130	4 - 10
Chrome Moly Steels														
4130, 4140	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
4142, 4150	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
41L50	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
4150H	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
Crome Alloy Steels														
5045, 5046	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
5120, 5135	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
5140, 5160	220	7 - 11	210	6 - 10	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 10	130	4 - 10
50100, 52100	180	5 - 9	170	5 - 9	160	5 - 9	150	4 - 8	130	4 - 8	120	3 - 7	100	3 - 7
6117, 6120	220	7 - 11	210	6 - 10	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 10	130	4 - 10
6150	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
Nickel Chrome-Moly Steels														
4317, 4320	230	7 - 11	220	7 - 11	210	6 - 10	190	6 - 10	170	5 - 9	150	4 - 8	140	3 - 7
4337, 4340	210	5 - 9	200	5 - 9	190	5 - 9	170	4 - 8	160	4 - 8	140	3 - 7	130	3 - 7
8615, 8620, 8627	230	7 - 11	220	7 - 11	210	6 - 10	190	6 - 10	170	5 - 9	150	4 - 8	140	3 - 7
8630, 8640, 8645	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
8647, 8660	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
8715, 8750	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
9310, 9317	170	2 - 6	160	2 - 6	150	1 - 5	130	1 - 5	120	1 - 5	110	1 - 5	100	1 - 5
9437, 9445	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
9747, 9763	230	7 - 11	220	7 - 11	210	6 - 10	190	6 - 10	170	5 - 9	150	4 - 8	140	3 - 7
9840, 9850	220	7 - 11	210	6 - 10	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 10	130	4 - 10
E9310	180	5 - 9	170	5 - 9	160	5 - 9	150	4 - 8	130	4 - 8	120	3 - 7	100	3 - 7
Nickel-Moly Steels														
4608, 4621	220	7 - 11	210	6 - 10	200	6 - 10	180	5 - 9	160	5 - 9	140	4 - 10	130	4 - 10
4640	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
4812, 4820	180	5 - 9	170	5 - 9	160	5 - 9	150	4 - 8	130	4 - 8	120	3 - 7	100	3 - 7
Silicon Steels														
9255, 9260	180	5 - 9	170	5 - 9	160	5 - 9	150	4 - 8	130	4 - 8	120	3 - 7	100	3 - 7
9261, 9262	170	2 - 6	160	2 - 6	150	1 - 5	130	1 - 5	120	1 - 5	110	1 - 5	100	1 - 5

*** Reduce speeds by 50% for carbon blades. For carbide tipped blades, ask your Morse sales contact.**

BLADE SPEED/REMOVAL RATES

For use with Bi-Metal Blades*

Stock Dimensions Tooth Pitch	Up to 2" 5-8, 4-6, 3-4		From 2" - 4" 4-6, 3-4		From 4" - 6" 3-4, 2-3, 3 Sabre		From 6" - 10" 1.4-1.8, 1.5-1.9		From 10" - 12" 1.4-1.8, 1.5-1.9		From 12" - 16" 1.1-1.4, .75-1.25		From 16" - 20" 1.1-1.4, 1-1.3, .75-1.25	
Material (Annealed)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)	Blade Speed (SFPM)	Cutting Rate (SIPM)
Low Alloy Tool Steels														
L-6	180	5 - 9	170	5 - 9	160	5 - 9	150	4 - 8	130	4 - 8	120	3 - 7	100	3 - 7
L-7	180	5 - 9	170	5 - 9	160	5 - 9	150	4 - 8	130	4 - 8	120	3 - 7	100	3 - 7
Water-Hardening Tool Steels														
W-1	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
Die Steels														
D-2, D-3	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	70	1 - 5	60	1 - 5
D-7	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
A-2	180	4 - 8	170	4 - 8	160	4 - 8	150	4 - 8	130	3 - 7	110	3 - 7	100	2 - 6
A-6	140	2 - 6	130	2 - 6	130	2 - 6	120	1 - 5	110	1 - 5	100	1 - 5	90	1 - 5
A-10	110	2 - 6	100	2 - 6	100	2 - 6	90	2 - 6	80	2 - 6	70	2 - 6	60	2 - 6
O-1, O-2	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
O-6	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
Hot Work Tool Steels														
H-11, H12, H-13, H-13 Mod, H21	150	2 - 6	140	2 - 6	130	2 - 6	120	1 - 5	110	1 - 5	100	1 - 5	90	1 - 5
H-22, H-24 H-25	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
High Speed Tool Steels														
M-1	140	2 - 6	130	2 - 6	130	2 - 6	120	1 - 5	110	1 - 5	100	1 - 5	90	1 - 5
M-2, M-3	110	2 - 6	100	2 - 6	100	2 - 6	90	2 - 6	80	2 - 6	70	2 - 6	60	2 - 6
M-10	110	2 - 6	100	2 - 6	100	2 - 6	90	2 - 6	80	2 - 6	70	2 - 6	60	2 - 6
M-4, M-42	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
T-1	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
T-15	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
Mold Steels														
P-3	190	5 - 9	180	5 - 9	170	5 - 9	150	4 - 8	140	4 - 8	130	4 - 8	120	3 - 7
P-20	180	4 - 8	170	4 - 8	160	4 - 8	150	3 - 7	140	3 - 7	130	3 - 7	110	2 - 6
Shock Resistannt Tool Steels:														
S-1, S-7	180	4 - 8	170	4 - 8	160	4 - 8	150	4 - 8	130	3 - 7	110	3 - 7	100	2 - 6
S-2, S-5	150	2 - 6	140	2 - 6	130	2 - 6	120	1 - 5	110	1 - 5	100	1 - 5	90	1 - 5
Stainless Steels:														
201, 202, 302, 304	110	2 - 6	100	2 - 6	100	2 - 6	90	2 - 6	80	2 - 6	70	2 - 6	60	2 - 6
303,303F	120	2 - 6	110	2 - 6	100	2 - 6	100	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5
308, 309, 310, 330	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
314, 316, 317	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
321, 347	110	2 - 6	100	2 - 6	100	2 - 6	90	2 - 6	80	2 - 6	70	2 - 6	60	2 - 6
410, 420, 420F	140	2 - 6	130	2 - 6	130	2 - 6	120	1 - 5	110	1 - 5	100	1 - 5	90	1 - 5
416, 430F	180	4 - 8	170	4 - 8	160	4 - 8	150	3 - 7	140	3 - 7	130	3 - 7	110	2 - 6
430, 446	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
440 A, 440 B, 440 C	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
440 F, 443	140	2 - 6	130	2 - 6	130	2 - 6	120	1 - 5	110	1 - 5	100	1 - 5	90	1 - 5
17-4 PH	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
15-5 PH	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
Nickel Alloys														
2317	190	5 - 9	180	5 - 9	170	5 - 9	150	4 - 8	140	4 - 8	130	4 - 8	120	3 - 7
2330, 2345	170	2 - 6	160	2 - 6	150	1 - 5	130	1 - 5	120	1 - 5	110	1 - 5	100	1 - 5
2512, 2517	140	2 - 6	130	2 - 6	130	2 - 6	120	1 - 5	110	1 - 5	100	1 - 5	90	1 - 5
Monel	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
Monel R	140	2 - 6	130	2 - 6	130	2 - 6	120	1 - 5	110	1 - 5	100	1 - 5	90	1 - 5
Monel K-500	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
Monel KR	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
Duranickel	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
Inconel 600	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
Inconel 625	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
Inconel 718	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
Hastelloy B, Waspalloy	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
Nimonic 90	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
Nimonic 75	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
NI-SPAN-C 962, Rene 41	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
Rene 88	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
Titanium Alloys														
TI-4 AL-4 MO	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
TI-140 A 2CR-2M0	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
TI-150 A	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
CP Titanium	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
MST-GAL 4V	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5	50	1 - 5
TI-6AI-4V	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
99% PURE TITANIUM	100	1 - 5	90	1 - 5	90	1 - 5	80	1 - 5	70	1 - 5	60	1 - 5	50	1 - 5
Cast Iron														
A536 (60-40-18)	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
A536 (120-90-02)	200	6 - 10	190	6 - 10	180	5 - 9	160	4 - 8	140	4 - 8	120	4 - 8	100	3 - 7
A48 (Class 20-20ksi)	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
A48 (Class 40-40ksi)	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7
A48 (Class 60-60ksi)	250	5 - 9	240	5 - 9	230	5 - 8	210	4 - 8	200	4 - 8	180	3 - 7	160	3 - 7

CUT TIME CALCULATOR

The following chart will help you determine how long a cut will take by cross referencing the bar size to be cut with the removal rate being used.

Removal Rate - Square Inches Per Minute																			
Bar Dia.	Bar Area, In²	1 in²/min	2 in²/min	3 in²/min	4 in²/min	5 in²/min	6 in²/min	7 in²/min	8 in²/min	9 in²/min	10 in²/min	11 in²/min	12 in²/min	13 in²/min	14 in²/min	15 in²/min	16 in²/min	17 in²/min	18 in²/min
		Minutes Per Cut																	
1.00	0.79	.79	.39	.26	.20	.16	.13	.11	.10	.09	.08	.07	.07	.06	.06	.05	.05	.05	.04
1.25	1.23	1.2	.61	.41	.31	.25	.20	.18	.15	.14	.12	.11	.10	.09	.09	.08	.08	.07	.07
1.50	1.77	1.8	.88	.59	.44	.35	.29	.25	.22	.20	.18	.16	.15	.14	.13	.12	.11	.10	.10
1.75	2.41	2.4	1.2	.80	.60	.48	.40	.34	.30	.27	.24	.22	.20	.19	.17	.16	.15	.14	.13
2.00	3.14	3.1	1.6	1.0	.79	.63	.52	.45	.39	.35	.31	.29	.26	.24	.22	.21	.20	.18	.17
2.25	3.98	4.0	2.0	1.3	1.0	.80	.66	.57	.50	.44	.40	.36	.33	.31	.28	.27	.25	.23	.22
2.50	4.91	4.9	2.5	1.6	1.2	1.0	.82	.70	.61	.55	.49	.45	.41	.38	.35	.33	.31	.29	.27
2.75	5.94	5.9	3.0	2.0	1.5	1.2	1.0	.85	.74	.66	.59	.54	.49	.46	.42	.40	.37	.35	.33
3.00	7.07	7.1	3.5	2.4	1.8	1.4	1.2	1.0	.88	.79	.71	.64	.59	.54	.50	.47	.44	.42	.39
3.25	8.30	8.3	4.1	2.8	2.1	1.7	1.4	1.2	1.0	.92	.83	.75	.69	.64	.59	.55	.52	.49	.46
3.50	9.62	9.6	4.8	3.2	2.4	1.9	1.6	1.4	1.2	1.1	1.0	.87	.80	.74	.69	.64	.60	.57	.53
3.75	11.04	11.0	5.5	3.7	2.8	2.2	1.8	1.6	1.4	1.2	1.1	1.0	.92	.85	.79	.74	.69	.65	.61
4.00	12.57	12.6	6.3	4.2	3.1	2.5	2.1	1.8	1.6	1.4	1.3	1.1	1.0	1.0	.90	.84	.79	.74	.70
4.25	14.19	14.2	7.1	4.7	3.5	2.8	2.4	2.0	1.8	1.6	1.4	1.3	1.2	1.1	1.0	.95	.89	.83	.79
4.50	15.90	15.9	8.0	5.3	4.0	3.2	2.7	2.3	2.0	1.8	1.6	1.4	1.3	1.2	1.1	1.1	1.0	.94	.88
4.75	17.72	17.7	8.9	5.9	4.4	3.5	3.0	2.5	2.2	2.0	1.8	1.6	1.5	1.4	1.3	1.2	1.1	1.0	1.0
5.00	19.64	19.6	9.8	6.5	4.9	3.9	3.3	2.8	2.5	2.2	2.0	1.8	1.6	1.5	1.4	1.3	1.2	1.2	1.1
5.25	21.65	21.6	10.8	7.2	5.4	4.3	3.6	3.1	2.7	2.4	2.2	2.0	1.8	1.7	1.5	1.4	1.4	1.3	1.2
5.50	23.76	23.8	11.9	7.9	5.9	4.8	4.0	3.4	3.0	2.6	2.4	2.2	2.0	1.8	1.7	1.6	1.5	1.4	1.3
5.75	25.97	26.0	13.0	8.7	6.5	5.2	4.3	3.7	3.2	2.9	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.5	1.4
6.00	28.27	28.3	14.1	9.4	7.1	5.7	4.7	4.0	3.5	3.1	2.8	2.6	2.4	2.2	2.0	1.9	1.8	1.7	1.6
6.25	30.68	30.7	15.3	10.2	7.7	6.1	5.1	4.4	3.8	3.4	3.1	2.8	2.6	2.4	2.2	2.0	1.9	1.8	1.7
6.50	33.18	33.2	16.6	11.1	8.3	6.6	5.5	4.7	4.1	3.7	3.3	3.0	2.8	2.6	2.4	2.2	2.1	2.0	1.8
6.75	35.78	35.8	17.9	11.9	8.9	7.2	6.0	5.1	4.5	4.0	3.6	3.3	3.0	2.8	2.6	2.4	2.2	2.1	2.0
7.00	38.48	38.5	19.2	12.8	9.6	7.7	6.4	5.5	4.8	4.3	3.8	3.5	3.2	3.0	2.7	2.6	2.4	2.3	2.1
7.25	41.28	41.3	20.6	13.8	10.3	8.3	6.9	5.9	5.2	4.6	4.1	3.8	3.4	3.2	2.9	2.8	2.6	2.4	2.3
7.50	44.18	44.2	22.1	14.7	11.0	8.8	7.4	6.3	5.5	4.9	4.4	4.0	3.7	3.4	3.2	2.9	2.8	2.6	2.5
7.75	47.17	47.2	23.6	15.7	11.8	9.4	7.9	6.7	5.9	5.2	4.7	4.3	3.9	3.6	3.4	3.1	2.9	2.8	2.6
8.00	50.27	50.3	25.1	16.8	12.6	10.1	8.4	7.2	6.3	5.6	5.0	4.6	4.2	3.9	3.6	3.4	3.1	3.0	2.8
8.25	53.46	53.5	26.7	17.8	13.4	10.7	8.9	7.6	6.7	5.9	5.3	4.9	4.5	4.1	3.8	3.6	3.3	3.1	3.0
8.50	56.75	56.7	28.4	18.9	14.2	11.3	9.5	8.1	7.1	6.3	5.7	5.2	4.7	4.4	4.1	3.8	3.5	3.3	3.2
8.75	60.13	60.1	30.1	20.0	15.0	12.0	10.0	8.6	7.5	6.7	6.0	5.5	5.0	4.6	4.3	4.0	3.8	3.5	3.3
9.00	63.62	63.6	31.8	21.2	15.9	12.7	10.6	9.1	8.0	7.1	6.4	5.8	5.3	4.9	4.5	4.2	4.0	3.7	3.5
9.25	67.20	67.2	33.6	22.4	16.8	13.4	11.2	9.6	8.4	7.5	6.7	6.1	5.6	5.2	4.8	4.5	4.2	4.0	3.7
9.50	70.88	70.9	35.4	23.6	17.7	14.2	11.8	10.1	8.9	7.9	7.1	6.4	5.9	5.5	5.1	4.7	4.4	4.2	3.9
9.75	74.66	74.7	37.3	24.9	18.7	14.9	12.4	10.7	9.3	8.3	7.5	6.8	6.2	5.7	5.3	5.0	4.7	4.4	4.1
10.00	78.54	78.5	39.3	26.2	19.6	15.7	13.1	11.2	9.8	8.7	7.9	7.1	6.5	6.0	5.6	5.2	4.9	4.6	4.4

To find the area of bars larger than 10″ diameter use the formula "π(3.14) x radius²". Take half the diameter (radius) multiply it by itself. Then multiply that by 3.14. **Example:** 20″ bar. Half the diameter is 10″. 10 x 10 = 100. 100 x 3.14 = 314 square inches.

Blade Break-In: Extremely Important

The extremely sharp tooth points and edges of new blades must be broken-in before applying full feed pressure to the blade. A good analogy is that of writing with a freshly sharpened wooden pencil.

RECOMMENDED BREAK-IN PROCEDURE

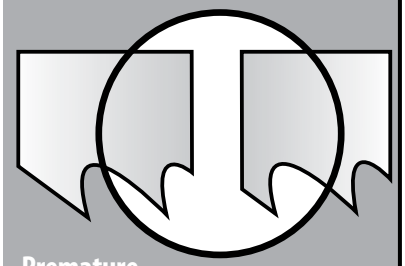
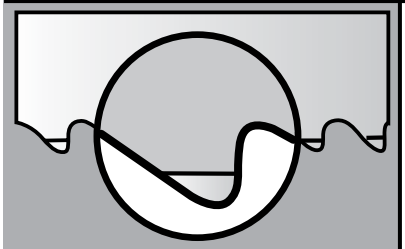
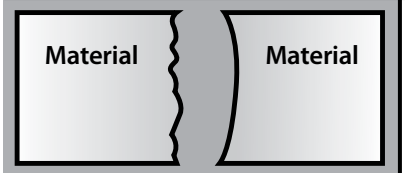
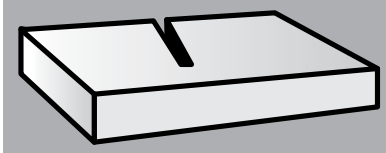
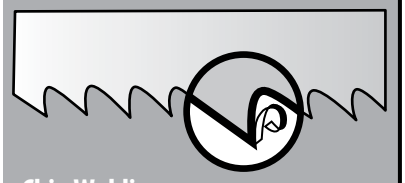
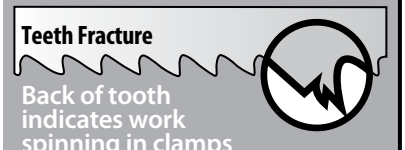
- **Maintain proper blade speed for the material to be cut.**
- **Reduce blade feed pressure or feed rate by 50% for the first 50 to 100 square inches of material cut.**
- **Gradually increase feed pressure or feed rate after break-in to target pressure or rate.**

Using Metal Chips to Troubleshoot

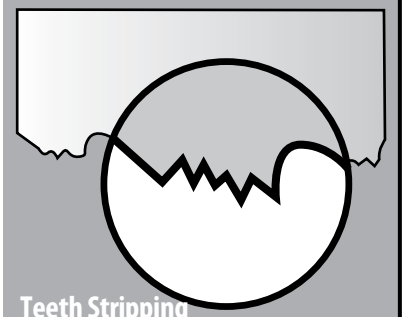
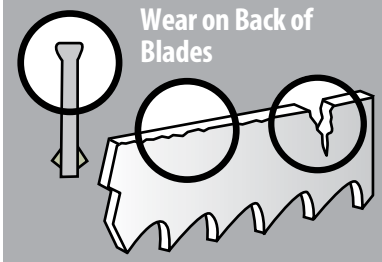
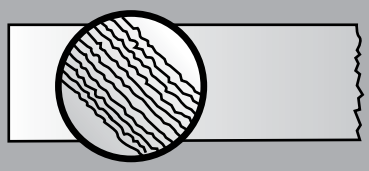
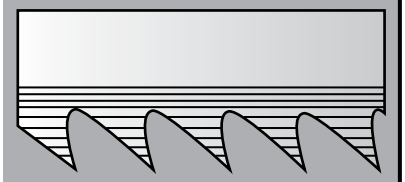
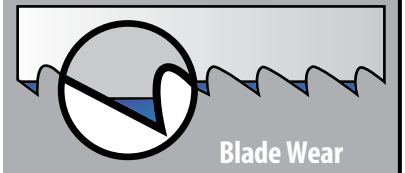
You can improve the productivity of your metal cutting operation by paying close attention to the chips made by the blade cutting through metal. This chart shows some of the common problems that can be discovered and solved by paying attention to chips

Chip Form	Chip Condition	Chip Color	Blade Speed	Blade Feed Rate	Other
	Thick, Hard and Short	Blue or Brown	Decrease ↓	Decrease ↓	Check Cutting Fluid & Mix
	Thin and Curled	Silver	Suitable ✔	Suitable ✔	
	Powder	Silver	Decrease ↓	Increase ↑	
	Thin and Tightly Curled	Silver	Suitable ✔	Decrease ↓	Check Tooth Pitch

BLADE PROBLEM SOLVING

Problem	Problem Cause	Solution
 **Premature Blade Breakage** Straight Break indicates fatigue	• Incorrect blade - teeth too coarse • Blade tension too high • Side guides too tight • Damaged or misadjusted blade guides • Excessive feed • Incorrect cutting fluid • Wheel diameter too small for blade • Blade rubbing on wheel flanges • Teeth in contact with work before starting saw • Incorrect blade speed	• Use finer tooth pitch • Reduce blade tension (see machine manual) • Check side guide clearance (see machine manual) • Check all guides for alignment/damage • Reduce feed pressure • Check coolant • Use thinner blade • Adjust wheel alignment • Allow 1/2" clearance before starting cut • Increase or decrease blade speed
 **Premature Dulling of Teeth**	• Teeth pointing in wrong direction / blade mounted backwards • Improper or no blade break-in • Hard spots in material • Material work hardened • Improper coolant • Improper coolant concentration • Speed too high • Feed too light • Teeth too small	• Install blade correctly. If teeth are facing the wrong direction, flip blade inside out • Break in blade properly (Page 17) • Check for hardness or hard spots like scale or flame cut areas • Increase feed pressure • Check coolant type • Check coolant mixture • Check recommended blade speed (Page 24-25) • Increase feed pressure • Increase tooth size
 **Inaccurate Cut**	• Tooth set damage • Excessive feed pressure • Improper tooth size • Cutting fluid not applied evenly • Guides worn or loose • Insufficient blade tension	• Check for worn set on one side of blade • Reduce feed pressure • Check tooth size chart (Page 23) • Check coolant nozzles • Tighten or replace guides, check for proper alignment • Adjust to recommended tension
Band Leading in Cut 	• Over-feed • Insufficient blade tension • Tooth set damage • Guide arms loose or set too far apart • Chips not being cleaned from gullets • Teeth too small	• Reduce feed force • Adjust recommended tension • Check material for hard inclusions • Position arms as close to work as possible. Tighten arms. • Check chip brush • Increase tooth size
 **Chip Welding**	• Insufficient coolant flow • Wrong coolant concentration • Excessive speed and/or pressure • Tooth size too small • Chip brush not working	• Check coolant level and flow • Check coolant ratio • Reduce speed and/or pressure • Use coarser tooth pitch • Repair or replace chip brush
 Back of tooth indicates work spinning in clamps	• Incorrect speed and/or feed • Incorrect blade pitch • Saw guides not adjusted properly • Chip brush not working • Work spinning or moving in vise	• Check cutting chart (Page 24-25) • Check tooth size chart (Page 23) • Adjust or replace saw guides • Repair or replace chip brush • Check bundle configuration/adjust vise pressure
 **Irregular Break** Indicates material movement	• Indexing out of sequence • Material loose in vice	• Check proper machine movement • Check vise or clamp

BLADE PROBLEM SOLVING

Problem	Problem Cause	Solution
 Teeth Stripping	• Feed pressure too high • Tooth stuck in cut • Improper or insufficient coolant • Incorrect tooth size • Hard spots in material • Work spinning in vise - loose nest or bundle • Blade speed too slow • Blade teeth running backwards • Chip brush not working	• Reduce feed pressure • Do not enter old cut with a new blade • Check coolant flow and concentration • Check tooth size chart (Page 23) • Check material for hard inclusions • Check clamping pressure - be sure work is held firmly • Increase blade speed - see cutting chart (Page 24-25) • Reverse blade (turn inside out) • Repair or replace chip brush
Wear on Back of Blades 	• Excessive feed pressure • Insufficient blade tension • Back-up guide roll frozen, damaged, or worn • Blade rubbing on wheel flange	• Decrease feed pressure • Increase blade tension and readjust guides • Repair or replace back-up roll or guide • Adjust wheel cant
 Rough Cut Washboard surface Vibration and or chatter	• Dull or damaged blade • Incorrect speed or feed • Insufficient blade support • Incorrect tooth pitch • Insufficient coolant	• Replace with new blade • Increase speed or decrease feed • Move guide arms as close as possible to the work • Use finer pitch blade • Check coolant flow
Wear Lines, Loss of Set 	• Saw guide inserts or wheel flange are riding on teeth • Insufficient blade tension • Hard spots in material • Back-up guide worn	• Check machine manual for correct blade width • Tension blade properly • Check material for inclusions • Replace guide
Twisted Blade Profile sawing 	• Blade binding in cut • Side guides too tight • Radius too small for blade width • Work not firmly held • Erratic coolant flow • Excessive blade tension	• Decrease feed pressure • Adjust side guide gap • Use narrower blade • Check clamping pressure • Check coolant nozzles • Decrease blade tension
 Blade Wear Teeth blued	• Incorrect blade • Incorrect feed or speed • Improper or insufficient coolant	• Use coarser tooth pitch • Increase feed or decrease speed • Check coolant flow

Blade Usage Notes

Experience is often the best way to save time and money in your usage of band saws for repeated cutting applications. By tracking the type of blades used, blade life, cut times and machine settings for a given material, you will develop a knowledge base for later comparison. It will also better equip the technical support staff at M. K. Morse to help you get optimum results in your band saw usage.

BLADE SELECTION WORKSHEET

Blade Recommendation Checklist

Complete by: _____ **Date** _____

Contact Morse Technical Assistance
Complete and Fax to: *1-330-453-1111*
or call 1-330-453-8187
or visit **www.bladewizard.com**

User Information

Company: _____

Address: _____

_____

Contact: _____

Phone No.: _____

Distributor Information

Company: _____

Address: _____

_____

Contact: _____

Phone No.: _____

Fax No.: _____

e-mail: _____

Blade Information

Manufacturer: _____

Length: _____ Width: _____

Thickness: _____ Tooth Pitch: _____

Type: ❑ Carbon ❑ Matrix ❑ M42 ❑ Other _____

Monthly blade usage: _____

Current blade distributor: _____

Current blade cost: $ _____ (ea.)

Machine Information

Make: _____

Model: _____

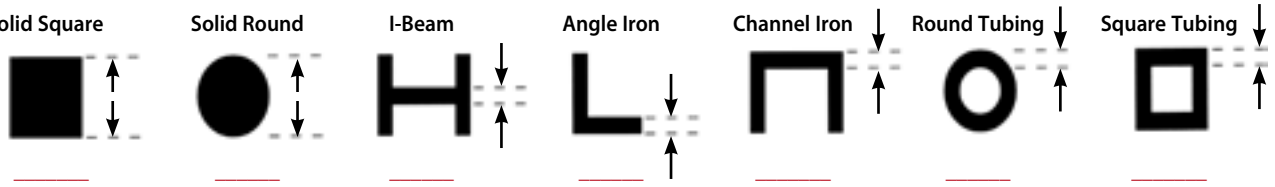
❑ Vertical ❑ Horizontal

Blade Speed (sfm): _____

Feed Rate: _____

Application Information

Solid Square | Solid Round | I-Beam | Angle Iron | Channel Iron | Round Tubing | Square Tubing



_____ _____ _____ _____ _____ _____ _____

On the red lines provided below each icon, **list material width** and **wall thickness** (if applicable) for each material type being cut

Types of Cutting

(Check all that apply)

❑ Single Piece Cut-off

❑ Bundled Cut-off 1. Number of pieces: _____ 2. Check each configuration that applies:

❑ ❑ ❑ ❑ ❑ ❑ ❑ ❑

Materials Being Cut

(Check all that apply)

Type	Grade
❑ Non-Ferrous	_____
❑ Mild Carbon Steels	_____
❑ Tool Steels	_____
❑ Stainless Steels	_____
❑ Super Alloys	_____
❑ Other	_____

Production Usage (per day)

❑ Light (2 hrs. or less)

❑ Medium (3-6 hrs.)

❑ Heavy (7 hrs. or more)

Problems with Present Blade

❑ Breaking blades ❑ Premature dulling

❑ Tooth strippage ❑ Crooked Cut

❑ Cost ❑ No Problems

Blade Recommendation

THE M. K. MORSE COMPANY

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