NACHI BIMETAL BANDSAW BLADES.

MADE IN JAPAN

AUTHORISED DISTRIBUTOR:

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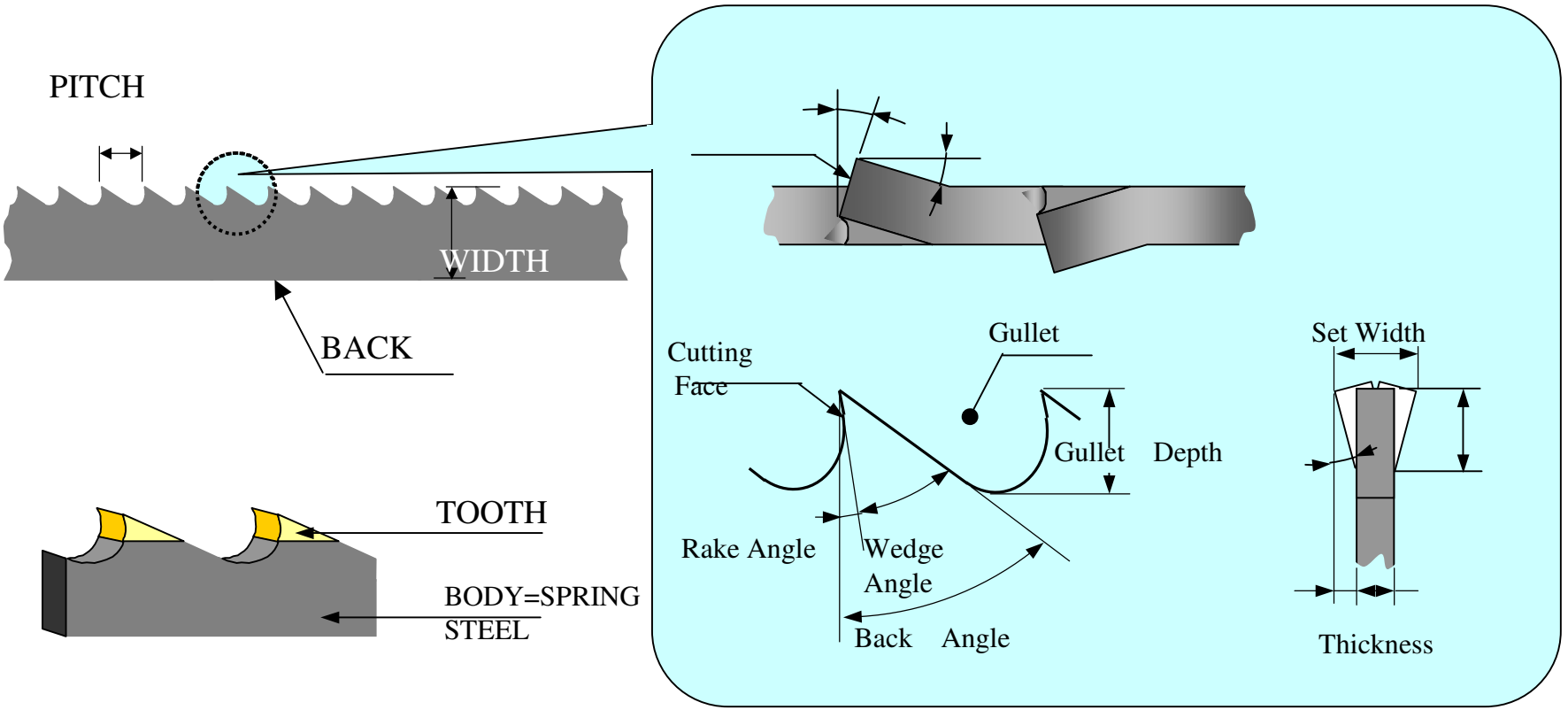
NOMENCLATURE

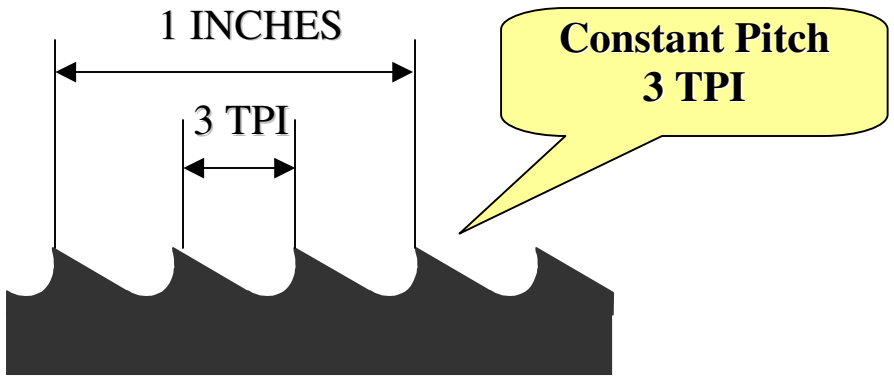
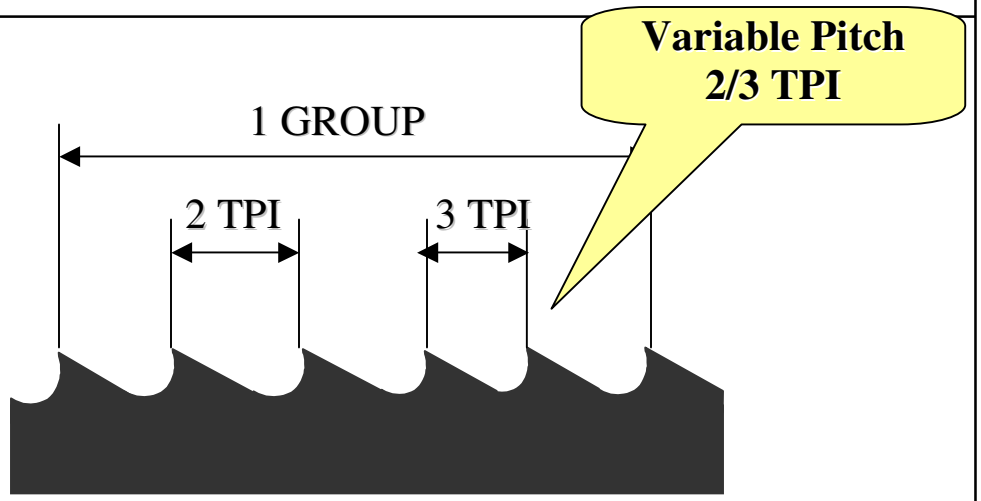


Tooth form

Types of Tooth Form	Tooth Form
● **Regular Tooth Form** • Wide application of materials, like Carbon Steels, Alloy Steels & FC • 0° rake angle is suitable for small diameter less than 50mm and thin plate. • 4T, 4/6T & above (Fine Pitch Tooth)	0 degree rake 
● **Hook Tooth Form** • Hook tooth form has sharp teeth permits good cutting performance. • Positive rake angle is suitable for tough and non ferrous materials. • 3T, 3/4T & below (Coarse Pitch Tooth)	Positive rake 

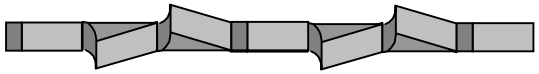
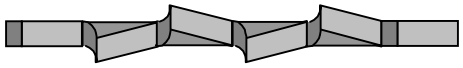
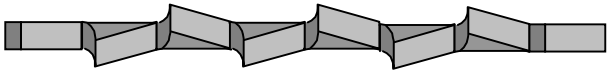
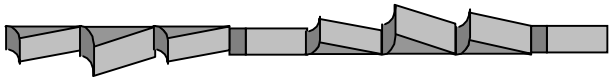
ピッチ　Tooth pitch

Tooth Pitch is defined as the number of teeth per inch (TPI)

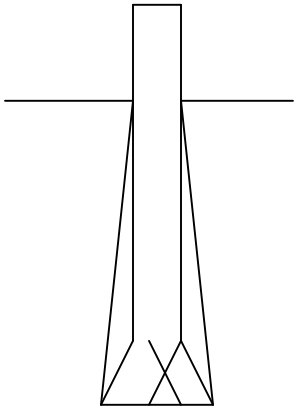
Pitch Type	Pitch Pattern
● **Constant Pitch** Constant pitch has uniform tooth spacing. - Use for solid material. **E.g. of 3TPI** **25.4 ÷3TPI=8.46mm**	
● **Variable Pitch (VL)** Variable pitch has different tooth spacing. Variable pitch has 2 types of pitch in one group. Variable pitch produce less noise and reduce vibration	

あさり形状　Type of tooth set

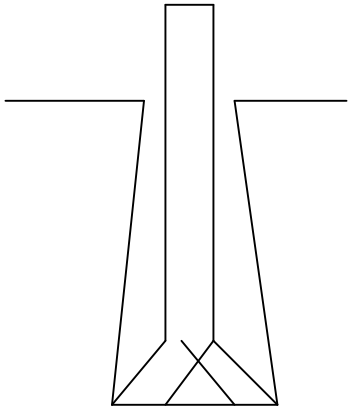
Tooth Set: The teeth are alternately protrude on the left and right of the band body.
It's allow clearance of the blade back through the cut.

Type of Tooth Set	Tooth Set Pattern
● **Standard Tooth Set** • Used in constant pitch. • 3 teeth sequence – left, right & straight.	**3 Tooth Set** 
● **Group Tooth Set** • Used in variable pitch. • Multi-teeth sequence. - Prefer for ferrous material	**5 Tooth Set**  **7 Tooth Set** 
● **Wave Tooth Set** • Used in fine pitch tooth. • Suitable for sheet metal, thin pipes.	**Wave Tooth Set** 

WT Type for residual stress material



Standard Tooth Set



WT Type Tooth Set

Note:

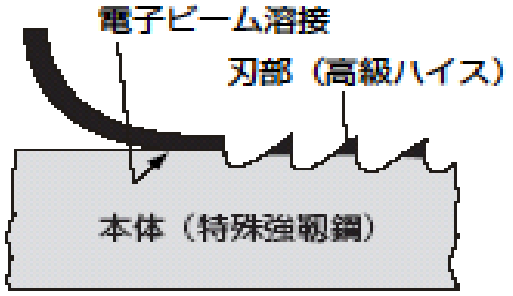
- **Tooth may break easily**
- **Finishing may be rough**

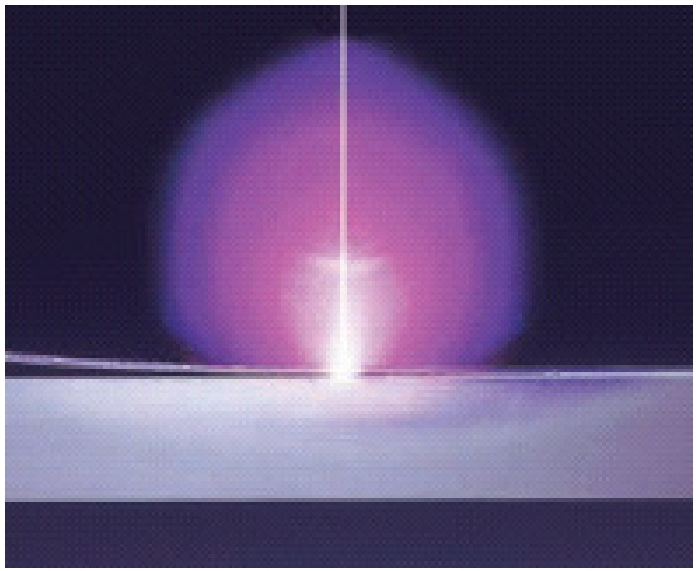
WT （WIDE TEETH SET）

In case of large self-stressing materials, band saw may be jammed by its stress. We recommend “WT type band saw blade” to avoid jamming.

刃部材質とﾊﾞｲﾒﾀﾙ構造 Tooth material & B.M.Construction

- **Tooth material is made of Powder HSS or Super HSS.**
- **Body material is made of spring steels.**
- **Tooth and body are welded strongly by electronic beam welding.**





TPI Selection Standard

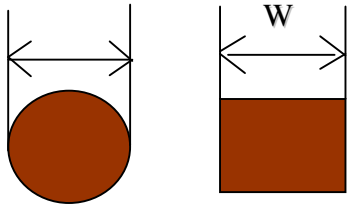
Band Saw Pitch Reference Table as below

Pitch too big -- cutting force increase in per tooth -- causes tooth break & bad finishing

Pitch too small -- chips stuck in groove of tooth -- causes breakage of band saw

Soft & elastic materials -- better to use slightly coarser pitch

Hard materials --better to use fine pitch

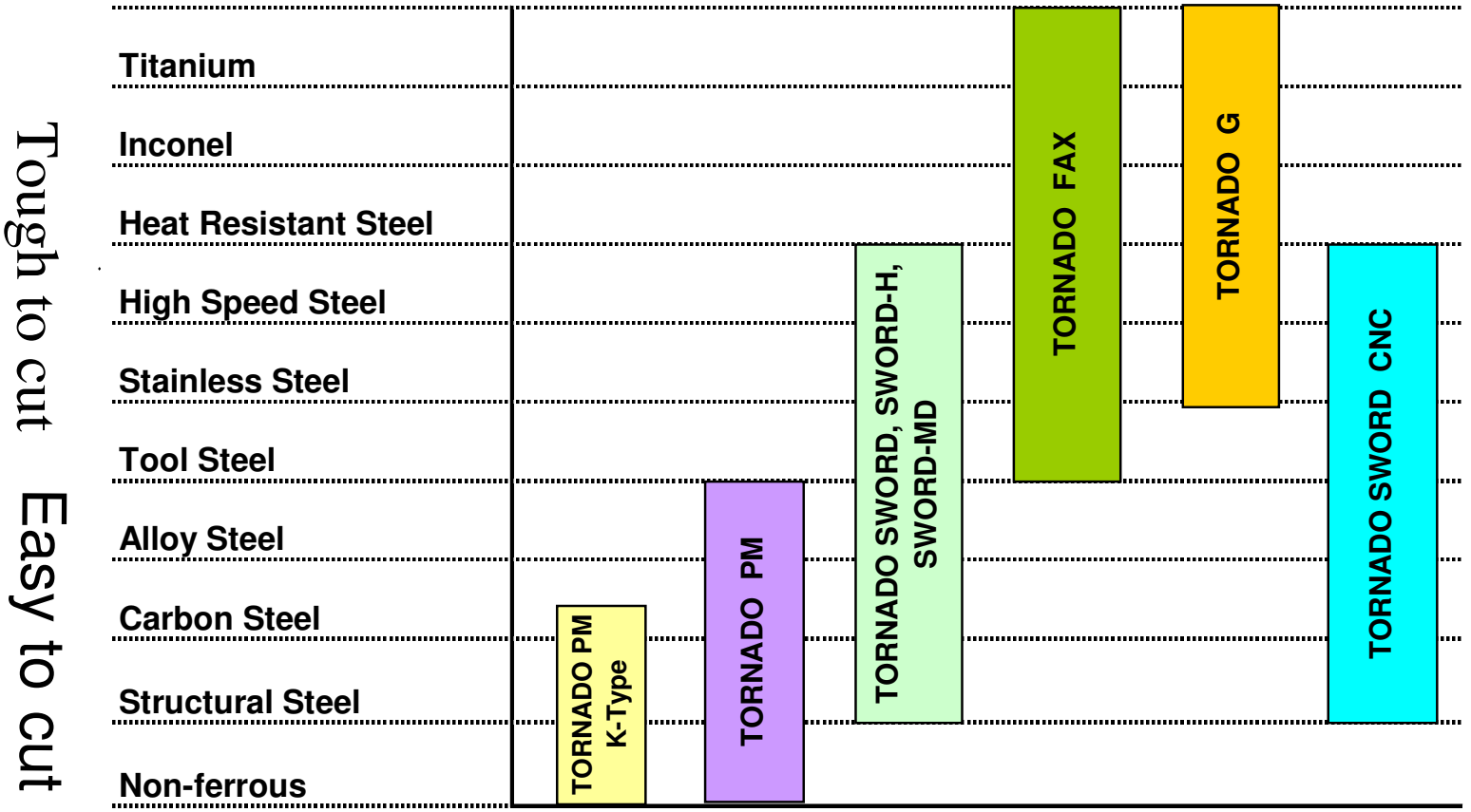


Solids

Teeth / TPI / W(mm)	CONSTANT PITCH					VL Variable Pitch					
	1.25	2	3	4	6	1/2	1.6/2	2/3	3/4	4/6	5/7
16 ~ 30											■
~ 60					■					■	
~ 100				■					■	■	
~ 150			■	■					■		
~ 200			■					■			
~ 300		■						■			
~ 400		■					■				
~ 600	■					■	■				
600 ~	■					■					

NACHI エコ&ECO Economy & Ecology

NACHI Metal Band Saw Selection



NACHI エコ&ECO

NACHI BAND SAW SERIES

NACHI BAND SAW PER MATERIAL APPLICATIO

applicable machine \ applicable material		非鉄金属		形鋼		一般鋼		
		Aluminum Copper alloy Carbon	Light gauge steel Tubing	H?? ???	Structural steels	Carbon Steels	Alloy steels	Pre-Hardened steels
Conven-tional Machine	??? ????? ??	Tornado PM-K 鉄骨切断用						
	??? ??? ??? GA ?????? TC???	Tornado PMとMV統合			TORNADO SWO (For general and Harde			
		High Speed Cutting and Longer Tool Life			Sword-H for High spped cutting		Swor fo Heavy	
CNC machines	??? ???????? ???????? ????????				TORNADO SWORD C			

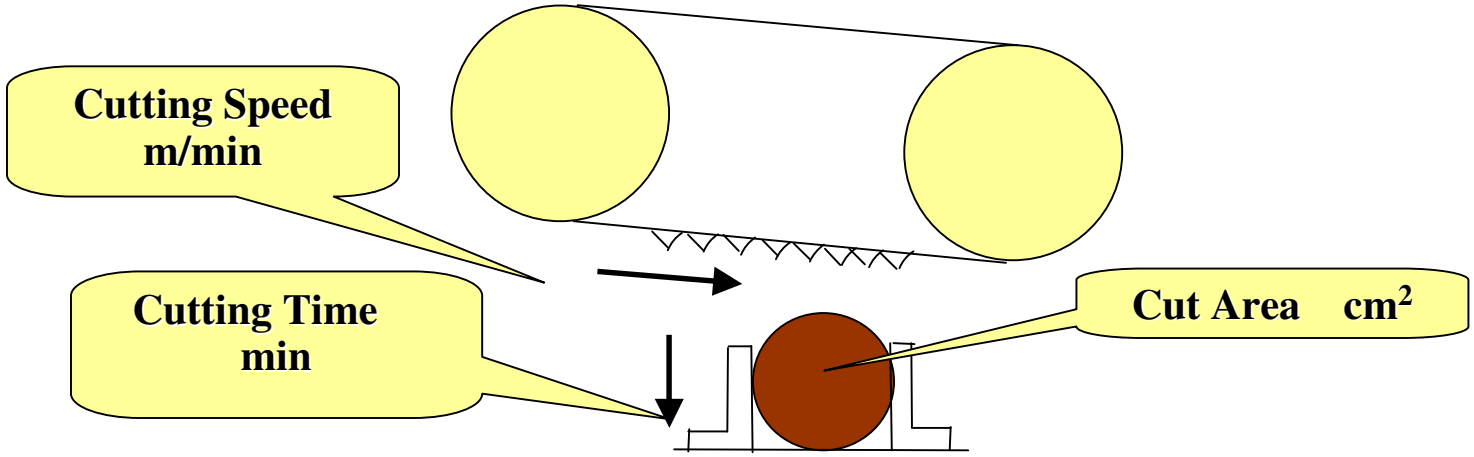
Material Grade to be cut	CUTTING CONDITIONS			Recommended blade
Structural steel	Cutting speed(m/min)	55		PM
	Cutting rate(cm2/min)	45 ~ 55		
Cast-hardening steels	Cutting speed(m/min)	55		PM
	Cutting rate(cm2/min)	40 ~ 50		
Alloy steel	Cutting speed(m/min)	40	55	PM and sword
Temopered steels	Cutting rate(cm2/min)	35 ~ 45	40 ~ 50	
Bearing steels	Cutting speed(m/min)	40		PM and sword
Spring steel,Tool steel	Cutting rate(cm2/min)	25 ~ 30		
Die steel	Cutting speed(m/min)	25	40	PM and sword
High speed tool steels	Cutting rate(cm2/min)	10 ~ 15	15 ~ 25	
Stainless steels	Cutting speed(m/min)	25	40	PM and sword
Heat resisting steel	Cutting rate(cm2/min)	10 ~ 15	15 ~ 25	
High heat-resistance alloy	Cutting speed(m/min)	25		sword/ FAX
Inconel,Hastalloy,Waspallo	Cutting rate(cm2/min)	5 ~ 10		
Aluminum base alloy	Cutting speed(m/min)	55	70	PM
Aluminum die cast	Cutting rate(cm2/min)	40 ~ 45	50 ~ 70	
Copper alloy	Cutting speed(m/min)	55	70	PM
	Cutting rate(cm2/min)	40 ~ 45	40 ~ 50	
Carbon graphitized	Cutting speed(m/min)	55	70	PM
	Cutting rate(cm2/min)	40 ~ 50	45 ~ 55	
Steel shapes	Cutting speed(m/min)	40	55	PM
	Cutting rate(cm2/min)	40 ~ 50	45 ~ 55	

Cutting Condition

Cutting Speed -- Movement speed of Band Saw in 1 min as m/min based on the work materials to be cut

Cutting Rate -- Work piece area being cut in 1 min as cm^2/min

$$\text{Cutting Rate } cm^2/min = \frac{\text{Cutting area } cm^2}{\text{Cutting Time min}}$$

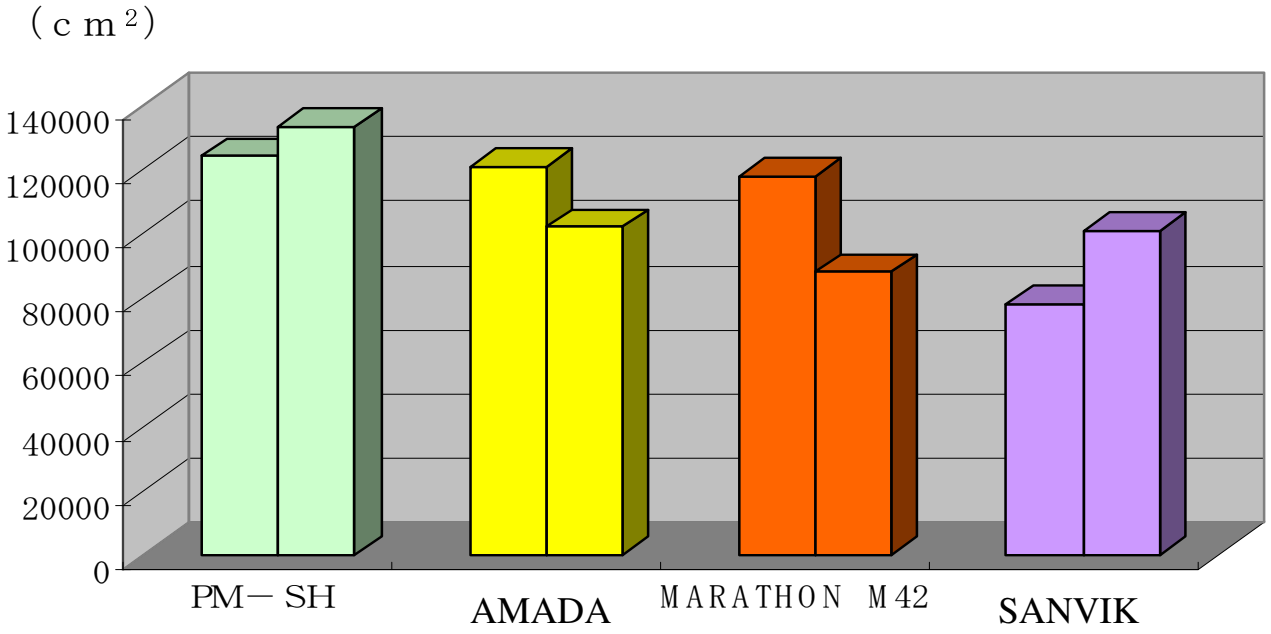


SWORD PERFORMANCE

SAWING S45C

Cutting Condition

- Material：Machine Structural　Ｓ４５Ｃ　Φ３００
- Band Saw Size：SH　４５７０×３４×１．０７×２／３
- Machine　：HA-４００
- Cutting Speed　：V＝５５m/min
- Cutting Time　：１３分/min（Rate＝５４cm２/min）
- Result　：Total area of cut　ｃｍ²

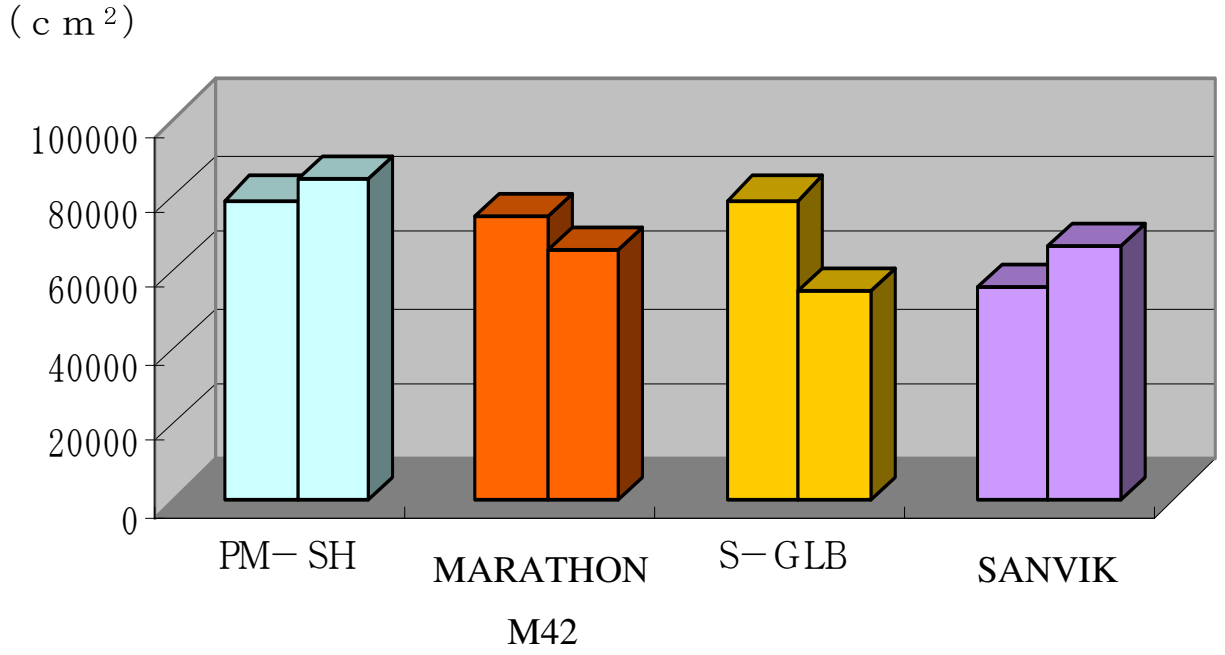


SWORD PERFORMANCE

SAWING SKD11

Cutting Condition

- **Material：Cold work tool steels SKD11 Φ200**
- **Band Saw Size： SH ４５７０×３４×１．０７×２／３**
- **Machine ： HA-４００**
- **Cutting Speed ： V＝40m/min**
- **Cutting Time ： 14．5分/min（Rate＝22 cm２/min）**
- **Result ： Total area of cut ｃｍ²**



BAND SAW TROUBLE SHOOTING

Sr.NO	Failure mode	Reasons	Solutions
1	The cutting plane bends	Carbide guide loose	Replace or fix properly the
	(Taper cutting)	Carbide guides worn out	carbide guides.
		Fine pitch for the application	Select correct TPI.
		Cutting rate too high or improper speed	Select proper speed & cutting rate
		Guide arms spread too far	Place arms closer to the work.
		Insufficient coolent	Add sufficient coolent
		Low blade tension.	Set correct tension.
		Machine arms out of alignment	Check & correct the alignment.
2	Blade Breakages	Excess tension on blade.	Set correct tension.
		Cutting rate too high.	Select proper cutting rate.
		Movement of the work material due to improper clamping	Ensure proper clamping.
		Worn out top guide.	Replace or adjust top guide.
		Blade rubbing against some machine part like band wheel collar.	Adjust the m/c part properly to avoide such rubbing.
		Machine arms out of alignment	Check & correct the alignment.

BAND SAW TROUBLE SHOOTING

Sr.NO	Failure mode	Reasons	Solutions
3	Chipping of teeth	Speed too slow	Select proper speed .
		Cutting rate too high	Select proper cutting rate
		Wrong TPI.	Select correct TPI.
		Movement of the work material due to improper clamping	Ensure proper clamping.
		Wire brush missing or not working properly.	Check & adjust position of the wire brush
4	Blade wears early.	Speed too high.	Select proper speed .
		Cutting rate too low.	Select proper cutting rate
		Insufficient coolent	Add sufficient coolent
		Wrong TPI.	Select correct TPI.
5	Blade stuck in the work	Speed too slow.	Select proper speed .
		Cutting rate too high.	Select proper cutting rate
		Air mixed with feed cylinder.	Remove air & see leakages.
		Wheel face worn out.	Replace wheels.
		Tension too low.	Set correct tension.

Band Saw Testing Report

1. **Customer:**

2. **Work Materials:**

   Mat: Size　　• Shape　　Cut area　　c m ^{2}

3. **Cutting Condition**

   Band Saw: Brand　　OAL　　×Width　　×Thickness　　×TPI

   Machine Maker:　　Type:

4. **Cutting Condition**

	A condition	B Condition
Cutting Speed m/min		
Cutting Time min/cut		
Cutting Rate cm2/min		

5. **Test Result:**

6. **Remark:**