



Tornado

NACHI

The Industrial Shop™

メタルバンドソー

Metal Band Saw Blades

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www.theindustrialshop.com

Tornado Series selection

| Work material | | Section steels | | Nonferrous metal | General steels | | |
|--------------------|--|--|--|--|-------------------|---------------|--------------|
| | | Light gauge steels H · C · L section steels Thin pipe Steel sheet | Section steels H section steels Thick pipe | Aluminum alloys Copper alloys Carbon | Structural steels | Carbon steels | Alloy steels |
| Machine | General-purpose | <div style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p style="text-align: center;">Tornado PM-K For Section steels</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p style="font-size: 2em;">↓</p> <p style="margin: 0;">High speed & Long life</p> <p style="font-size: 2em;">↓</p> </div> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p style="font-size: 1.5em;">Tornado PM</p> </div> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p style="font-size: 1.5em;">PM-H For high speed cutting</p> </div> </div> | | | | | |
| | Section steels HK, HKA ST GT, GTA | | | | | | |
| | Solids H, HA HFA HBA, PBA TC, TB S GA SGA | | | | | | |
| CNC CNC machine | Solids HFA300CNC HFA400CNC HFA500CNC SGA410CNC SGA8010CNC SGA8513CNC | <div style="border: 1px solid black; padding: 10px; display: inline-block;"> <p style="font-size: 1.2em;">Tornado PM CNC</p> </div> | | | | | |



Difficult machining steels

| | | | |
|--|--|--------------------------|-----------------------|
| Alloy tool steels Pre-hardened steels | Mold steels High speed steels Stainless steels | HRC43 Hardened steels | Heat resistant alloys |
| | | | |

Tornado Sword








Sword-H
For high speed cutting

Sword-MD
For high quality cutting

Tornado FAX

Tornado Sword G

Tornado Sword CNC

| Description of Mark | Explanation | | Explanation | |
|---|---|---|---|------------|
| |  | TiCN multi layer Coat |  | Cobalt HSS |
|  | High Grade Powder HSS |  | Bi-Metal construction | |
|  | High Alloy HSS |  | Variable teeth pitch | |
|  | Cobalt HSS | | | |

Stocking marks

● : Stocked items

△ : Manufactured upon request

No mark : Not manufactured

Selection Chart

| Type | Features | Product Name | Tooth Material | Wear Resistant | Chipping Resistant |
|---|---|---------------------------|----------------|----------------|--------------------|
| For cut off Machine | For Non Special Steels and Other Metals | Tornado PM | PM | 4 | 5 |
| | For Non Special Steels and Other Metals on CNC Machine compatible | Tornado PM CNC | | 4 | 4 |
| | For Non Special Steels and Other Metals High Speed Cutting | Tornado PM-H | | 4 | 4 |
| | For Sections and Pipes. Low Noise and Vibration | Tornado PM-K ¹ | | 4 | 7 |
| | General purpose for difficult-to-cut materials | Tornado Sword | SW | 5 | 3 |
| | For hard steels - CNC compatible | Tornado Sword CNC | | 5 | 3 |
| | For high speed cutting for Mould and Die steels | Tornado Sword - H | | 5 | 4 |
| | For Accurate Cutting of Die and Mould steels | Tornado Sword - MD | | 6 | 3 |
| | High hardness difficult to cut material | Tornado FAX | FAX | 5 | 4 |
| | For best tool life in case of hard and tough steels | Tornado G-FAX | | 8 | 2 |
| For best tool life in case of hard and tough steels | Tornado Sword G | SW | 8 | 2 | |

Blade Material

FAX: High performance high alloy high speed SW: High alloy high speed

PM: High performance cobalt high HSSCo: Cobalt High

Selection Teeth

● Solids

| Size of Material | Pitch | | | | | | | | | | | | | | | | |
|------------------|--------|-------|--------|-------|-----|-----|-----|-----|-----|-----|-----|------|--|------|----|----|----|
| | | | (1.25) | | (2) | | (3) | | (4) | 6 | | 8 | | 10 | 12 | 14 | 18 |
| mm | 0.75/1 | 1/1.5 | ½ | 1.5/2 | | 2/3 | | 3/4 | | 4/6 | 5/7 | 6/10 | | 8/12 | | | |
| ~4 | | | | | | | | | | | | | | | | | |
| ~10 | | | | | | | | | | | | | | | | | |
| ~20 | | | | | | | | | | | | | | | | | |
| ~40 | | | | | | | | | | | | | | | | | |
| ~60 | | | | | | | | | | | | | | | | | |
| ~100 | | | | | | | | | | | | | | | | | |
| ~150 | | | | | | | | | | | | | | | | | |
| ~200 | | | | | | | | | | | | | | | | | |
| ~300 | | | | | | | | | | | | | | | | | |
| ~400 | | | | | | | | | | | | | | | | | |
| ~600 | | | | | | | | | | | | | | | | | |
| ~800 | | | | | | | | | | | | | | | | | |
| 800~ | | | | | | | | | | | | | | | | | |

| | | |
|----------------------|---------------------|--------------------|
| Application Machines | For Cut Off Machine | For Rotary Machine |
| | For Contour Machine | |

In case of Bundle Cutting of round bars, please select one TPI lower than applicable for bundle length.

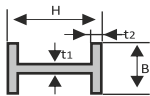
◎ : Excellent ○ : Good × : Not Used (No mark) : Not recommended

| Structurals, Tubing | | Solids | | | | | | | |
|--|--|---------------------------------|---------------------|--------------------------|---|---|--------------------------|--|--|
| SS, SM, SN Light gauge steels H-C-L section steels Thin pipe Steel sheet | SS, SM, SN Section steels H section steels Thick pipe | SS, SC, SM Structural steels | SC Carbon steels | Scr, SCM Alloy steels | SKS, NAK Alloy tool steels Pre-hardened steels | Mould steels High speed steels Stainless steels | Heat resistant alloys | Aluminum alloys Copper alloys Carbon | |
| ○ | ○ ¹ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ | |
| × | × | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | |
| × | × | ◎ | ◎ | ◎ | ◎ | ○ | | ○ | |
| ◎ | ◎ | ○ | ○ | | | × | × | | |
| × | × | ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | |
| × | × | ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | |
| × | × | ○ | ◎ | ◎ | ◎ | ○ | ○ | ○ | |
| × | × | | ○ | ○ | ◎ | ◎ | ◎ | | |
| × | × | | ○ | ○ | ◎ | ◎ | ○ | | |
| × | × | | ○ | ○ | ◎ | ◎ | ◎ | | |
| × | × | | ○ | ○ | ◎ | ◎ | ◎ | | |

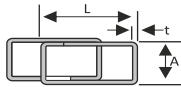
Note 1) In case of large selfstressing materials, band saw may be jammed by its stress.
We recommend "WT type band saw blade" to avoid this jamming.

● **Structural steels and tubes**

● **H section steels**



● **Light gauge steels**



● **Tube**



| Size of Material | | | | TPI |
|------------------|-----|----------------|----------------|----------|
| H | B | t ₁ | t ₂ | |
| 300 | 150 | 6 | 9 | 5/7 |
| 400 | 200 | 8 | 13 | 3/4 |
| 500 | 200 | 10 | 16 | 3/4 |
| 600 | 200 | 11 | 17 | 3/4 |
| 700 | 300 | 13 | 24 | 3/4 |
| 800 | 300 | 14 | 26 | 2/3, 3/4 |
| 900 | 300 | 16 | 28 | 2/3 |

| Size of Material | | | TPI |
|------------------|----|-----|------|
| L | A | T | |
| 60 | 30 | 1.6 | 14 |
| 75 | 45 | 1.6 | 12 |
| 100 | 50 | 2.0 | 8/12 |
| 125 | 50 | 3.2 | 8/12 |
| 150 | 65 | 3.2 | 6/10 |
| 200 | 75 | 4.0 | 6/10 |
| 250 | 75 | 4.5 | 5/7 |

| t | D | TPI | | | | | | |
|----|---|-----|------|------|------|------|------|------|
| | | 20 | 40 | 60 | 80 | 120 | 160 | 200 |
| 2 | | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 4 | | 14 | 14 | 12 | 12 | 8/12 | 8/12 | 6/10 |
| 6 | | | 8/12 | 8/12 | 6/10 | 6/10 | 5/7 | 5/7 |
| 8 | | | | 6/10 | 6/10 | 5/7 | 5/7 | 4/6 |
| 10 | | | | | 5/7 | 5/7 | 4/6 | 4/6 |
| 12 | | | | | | 4/6 | 4/6 | 4/6 |

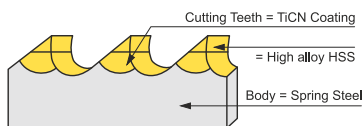
In case of cutting sections, please select a TPI such that any time at least two teeth are engaged in the section.

TORNADO SWORD G



Features

- High Alloy HSS with TiCN Coating gives longer tool life.
- Excellent anti-adhesion.
- Excellent chip flow.



Work Materials

- (32HRC) Tempered steels (to 32HRC)
- Mold steels
- HSS
- Stainless steels
- High-temperature steels

Performance

| Band saw | Number of cuts (pieces) | | |
|---------------------------------|---|----|----|
| | 10 | 20 | 40 |
| Tornado Sword G | Work material: SUJ 2 cast material Φ 160 Saw blade: 4670 × 41 × 1, 3 × 2 \downarrow Cutting speed: 35 m / min Cutting rate: 17 cm 2 / min | | |
| Other company's product M42 | | | |
| Tornado Sword G Our products PM | Work material: SKD 61 Φ 300 Saw blade: 5300 × 41 × 1, 3 × 2 \downarrow Cutting speed: 30 m / min Cutting rate: 21 cm 2 / min | | |
| Other company's product M42 | | | |
| Tornado Sword G | Work material: SUS 304 Φ 320 Saw blade: 4570 × 34 × 1,0 7 × 2 \downarrow Cutting speed: 30 m / min Cutting rate: 13 cm 2 / min | | |
| Other company's product M42 | | | |

TORNADO SWORD CNC TORNADO PM CNC



Features

- Longer fatigue life by body material of spring steels.
- Faster cutting by positive rake and wide gullets.
- Smooth finish and straight cut.

Work Materials

- Structural steels
- Alloy steels
- Stainless steels
- High-temperature steels
- Tool steels

Applicable Machines

HFA-300CNC, 400CNC, 500CNC
SGA410CNC, SGA8010CNC, SGA8513CNC

Performance

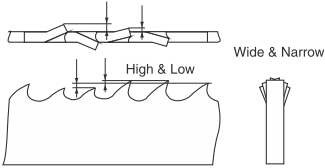
| Band saw | (TPI) | Lifespan × 10 ⁴ (cm ²) | |
|----------------------|-------|---|----|
| | | 5 | 10 |
| Tornado Sword CNC | 3/4H | Workpiece: SUS Casting Φ 160 | |
| Conventional product | 3/4 | | |
| Tornado Sword CNC | 2/3H | Workpiece material: S45C Φ 280 | |
| Conventional product | 2/3 | | |
| Tornado Sword CNC | 2/3H | Work material: SKD 61 Φ 300 | |
| Conventional product | 2/3 | | |

TORNADO SWORD MD



Features

- Long tool life by high alloy HSS.
- Smooth finish and straight cut.



TORNADO PM-K



Features

- Suitable for profiles and bundles.
- Excellent chipping resistance and low vibration in VL pitch pattern.
- Longer life by tooth made from Super HSS.

Work Materials

- Structure materials

Pipe Column H-section steel Angle C-section steel (Channel) Sheet pile



TORNADO SWORD

- It is suitable for Stainless steels



TORNADO SWORD CNC

- Applicable for CNC machine by adoption of tough spring steels as the body material. For difficult to cut steels.



How to order

Type Full length Width Number of Teeth

Stocking marks

●: Stocked items

△: Manufactured upon request

No mark: Not manufactured

| Width | Thickness | Stock | | | | | | |
|-------|-----------|--------|-------|-----|-------|-----|-----|-----|
| | | TPI | | | | | | |
| | | 0.75/1 | 1/1.5 | 1/2 | 1.5/2 | 2/3 | 3/4 | 4/6 |
| 27 | 0.95 | | | | | | △ | △ |
| 34 | 1.07 | | | | | △ | △ | |
| 41 | 1.3 | | | | | △ | △ | |
| 54 | 1.6 | | △ | △ | △ | | | |
| 67 | 1.6 | △ | △ | △ | △ | | | |

Metal Band Saw Blades for Cut Off Machine

TORNADO PM

- Applicable from solid material to variant material.



How to order

Type Full length Width Number of Teeth

(Unit) : mm

| Width | Thickness | Stock | | | | | | | | |
|-------|-----------|--------|-------|-----|-------|-----|-----|-----|-----|------|
| | | TPI | | | | | | | | |
| | | 0.75/1 | 1/1.5 | 1/2 | 1.5/2 | 2/3 | 3/4 | 4/6 | 5/7 | 6/10 |
| 27 | 0.95 | | | | | △ | | △ | △ | △ |
| 27 | 1.07 | | | | | | △ | △ | | |
| 34 | 1.07 | | | | | △ | △ | △ | | |
| 41 | 1.3 | | | | | △ | △ | △ | | |
| 41 | 1.5 | | | | △ | | | | | |
| 54 | 1.6 | | △ | △ | △ | △ | △ | | | |
| 67 | 1.6 | | △ | △ | △ | △ | | | | |
| 80 | 1.6 | △ | | | | | | | | |

How to order

Type Full length Width Number of Teeth

(Unit) : mm

| Width | Thickness | Stock | | | |
|-------|-----------|-------|---|---|---|
| | | TPI | | | |
| | | 2 | 3 | 4 | 6 |
| 27 | 0.95 | | △ | △ | △ |
| 34 | 1.07 | △ | △ | △ | |
| 41 | 1.3 | △ | △ | | |

Stocking marks

● : Stocked items

△ : Manufactured upon request

No mark : Not manufactured

Metal Band Saw Blades for Cut Off Machine

TORNADO PM-WT

- WT Type Bandsaw blade

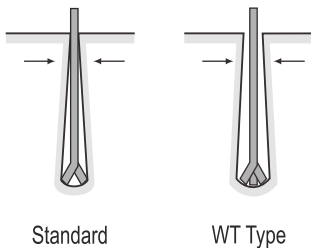


How to order

Type Full length Width Number of Teeth

(Unit) : mm

| Width | Thickness | Stock | |
|-------|-----------|-------|-----|
| | | TPI | |
| | | 2/3 | 3/4 |
| 41 | 1.3 | △ | △ |
| 54 | 1.6 | △ | △ |
| 67 | 1.6 | △ | △ |



Standard

WT Type

- WT Type Bandsaw blade

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

TORNADO PM-K

- This band saw blade having variable teeth pitch and strong teeth form is suitable for cutting of profiles and bundles.



How to order

Type Full length Width Number of Teeth



(Unit) : mm

| Width | Thickness | Stock | | |
|-------|-----------|-------|------|------|
| | | TPI | | |
| | | 2/3K | 3/4K | 4/6K |
| 27 | 0.95 | | △ | △ |
| 34 | 1.07 | | △ | △ |
| 41 | 1.3 | | △ | |
| 54 | 1.6 | △ | △ | |
| 67 | 1.6 | △ | △ | |

Stocking marks

● : Stocked items

△ : Manufactured upon request

No mark : Not manufactured



Metal Band Saw Blades for Cut Off Machine

TORNADO SWORD-H

- Applicable for high speed cutting by its sharp tooth design.



How to order

Type Full length Width Number of Teeth



(Unit) : mm

Please specify thickness only for width 54

| Width | Thickness | Stock TPI | |
|-------|-----------|--------------|------|
| | | 2/3H | 3/4H |
| | | 27 | 0.95 |
| 34 | 1.07 | △ | △ |
| 41 | 1.3 | △ | △ |
| 54 | 1.3 | △ | |
| 54 | 1.6 | △ | |
| 67 | 1.6 | △ | |

TORNADO FAX

- It is suitable for efficient cutting of hard to cut structural and tubing.



How to order

Type Full length Width Number of Teeth



(Unit) : mm

| Width | Thickness | Stock TPI | | |
|-------|-----------|--------------|------|-----|
| | | 1/2 | 2/3 | 3/4 |
| | | 27 | 0.95 | |
| 27 | 1.07 | | △ | △ |
| 34 | 1.07 | | △ | △ |
| 41 | 1.3 | | △ | △ |
| 54 | 1.6 | △ | △ | |
| 67 | 1.6 | △ | △ | |

TORNADO SWORD-MD

- Possible on a smooth cutting surface, and a small cutting resistance.



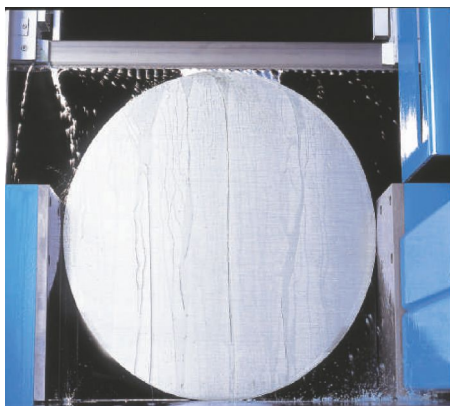
How to order

Type Full length Width Number of Teeth



(Unit) : mm

| Width | Thickness | Stock TPI | | | |
|-------|-----------|--------------|---------|-------|-------|
| | | 1/1.5MD | 1.5/2MD | 2/3MD | 3/4MD |
| | | 27 | 0.95 | | |
| 34 | 1.07 | | | △ | △ |
| 41 | 1.3 | | △ | △ | △ |
| 54 | 1.6 | △ | △ | △ | |
| 67 | 1.6 | △ | △ | △ | |



TORNADO G-FAX

- Applicable for difficult to machine materials, structures, tubes etc. For longer tool life in hardened steels



How to order

Type Full length Width Number of Teeth



(Unit) : mm

| Width | Thickness | Stock | |
|-------|-----------|-------|-----|
| | | TPI | |
| | | 2/3 | 3/4 |
| 27 | 0.95 | | △ |
| 34 | 1.07 | △ | △ |
| 41 | 1.3 | △ | △ |
| 54 | 1.6 | △ | |
| 67 | 1.6 | △ | |

TORNADO SWORD G

- Applicable for difficult to machine materials, structures, tubes etc.. For longer tool life in hardened steels.



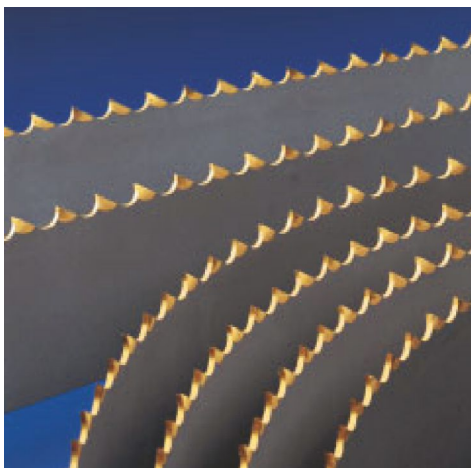
How to order

Type Full length Width Number of Teeth



(Unit) : mm

| Width | Thickness | Stock | |
|-------|-----------|-------|-----|
| | | TPI | |
| | | 2/3 | 3/4 |
| 27 | 0.95 | | △ |
| 34 | 1.07 | △ | △ |
| 41 | 1.3 | △ | △ |
| 54 | 1.6 | △ | |
| 67 | 1.6 | △ | |



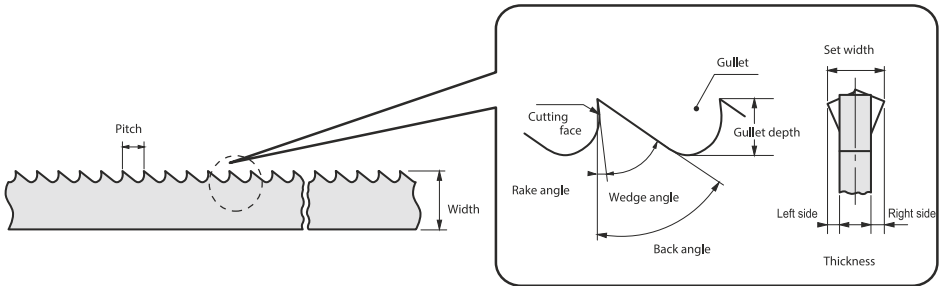
Stocking marks

- : Stocked items
- △ : Manufactured upon request
- No mark : Not manufactured

Packing quantity of metal band saw for cut-off machine Packed Quantity

Technical Reference

Nomenclature



Tooth form

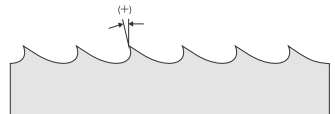
Regular tooth form

Regular tooth with rake angle of 0° is suitable for cutting short-chipping materials and high-carbon steels, tool steels and cast irons. This tooth form can be usually used for work piece with thin-plates.



Hook tooth form

Hook tooth with positive rake angle is suitable for long-chipping, tough materials, non-ferrous metals.



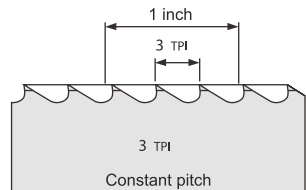
Tooth pitch

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

Constant pitch

Constant pitch has uniform tooth spacing.

2•3•4

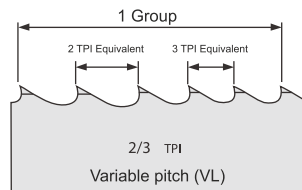


Variable pitch(VL)

Variable pitch has different tooth spacing within one tooth interval.

This pitch is marked by two dimensions, example $4/6$ (TPI).

$2/3 \cdot 3/4 \cdot 4/6$



Type of tooth set

By means of the tooth set, with which the teeth alternately protrude to the left and right beyond the level of the band body, free-cutting action of the band saw blade is achieved.

Standard tooth set

Three tooth sequence- left, right, straight, used in constant pitch.



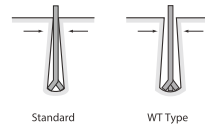
Group tooth set

Multi-tooth sequence depending on tooth pitch, used in variable pitch.



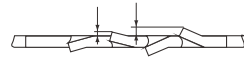
■ WT Type Bandsaw Blade for residual stress material

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



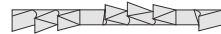
Combination tooth set

A set of teeth with different widths is used with high and low forms to reduce stress, cutting resistance and vibration.



Wave tooth set

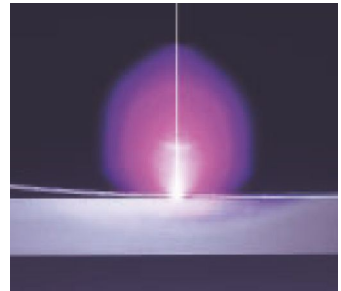
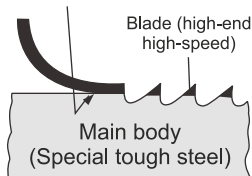
Wave tooth set is used in fine pitch tooth and suited for materials such as sheet metal, thin walled pipes and profiles.



Tooth material & Bi-Metal Construction






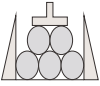

















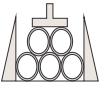
























Tooth material is made from Powder HSS or Super HSS and body material is made from spring steels. Tooth and body are welded strongly by Electron Beam Welding.

Electron Beam Welding



Various Clamping Methods based on the shape of materials and sections.

Bundle cutting in general is a complex process, resulting in chipping of teeth while cutting. The primary difficulties include moving of one element in the bundle during cutting, improper clamping and wrong selection of TPI etc. Following are the guidelines to clamp bundles.

| Shape | Clamp method by bundle number | | | | |
|---|---|---|---|---|--|
| | 1 Piece | 2 Piece | 3 Piece | 4 Piece | 5 Piece |
| Round bar  |  |  |  |  |  |
| Hexagonal bar  |  |  |  |  |  |
| H-section steel  |  |  |  |  |  |
| Pipe  |  |  |  |  |  |
| Square pipe  |  |  |  |  | |
| Groove shape steel  |  |  |  |  | |
| Chevron steel  |  |  |  |  |  |
| C-section steel  |  |  |  |  | |
| Rail  |  |  | | | |

Recommended Cutting Parameters

| Work materials | | Band dimension(mm) | | | | | |
|--|--|------------------------------------|--------------------------|--------------------------|--------------------------|-------------|---------|
| | | 27 × 0.95 | 34 × 1.07 | 41 × 1.3 | 54 × 1.6 | 67/80 × 1.6 | |
| | | Work length (mm) | | | | | |
| | | Condition | | | | | |
| | | 200 | 250 | 300 | 500 | 600 | |
| Structural steels | SS *** SM *** STKM *** | Cutting speed(m/min) | 70 ~ 80 | 60 ~ 70 | 50 ~ 60 | 45 ~ 50 | 40 ~ 50 |
| | | Cutting rate(cm ² /min) | 50 ~ 60 | | | 50 ~ 60 | |
| Cast-hardening steels Automatic steels | S * * C SUM ** SNCM *** | Cutting speed(m/min) | 65 ~ 80 | 55 ~ 70 | 50 ~ 65 | 40 ~ 55 | 40 ~ 55 |
| | | Cutting rate(cm ² /min) | 45 ~ 55 | | | 45 ~ 55 | |
| Alloy steels | SCr *** SCM *** | Cutting speed(m/min) | 55 ~ 70 | 50 ~ 65 | 45 ~ 60 | 40 ~ 55 | 40 ~ 55 |
| | | Cutting rate(cm ² /min) | 40 ~ 50 | | | 40 ~ 50 | |
| Bearing steels, Spring steels, Tool steels, Tempered steels | SUJ *** SUP *** SKS *** NAK *** | Cutting speed(m/min) | 40 ~ 55 | 40 ~ 55 | 35 ~ 50 | 30 ~ 45 | 30 ~ 45 |
| | | Cutting rate(cm ² /min) | 30 ~ 40 | | | 25 ~ 35 | |
| Mold steels, High-speed steels | SKD ** SKH ** | Cutting speed(m/min) | 35 ~ 45 | 30 ~ 45 | 25 ~ 40 | 25 ~ 40 | 20 ~ 35 |
| | | Cutting rate(cm ² /min) | 20 ~ 30 | | | 20 ~ 30 | |
| Stainless steels, Heat-resistant steels | SUS *** SUH *** SKT *** | Cutting speed(m/min) | 30 ~ 45 | 30 ~ 45 | 25 ~ 40 | 25 ~ 40 | 20 ~ 35 |
| | | Cutting rate(cm ² /min) | 20 ~ 30 | | | 20 ~ 30 | |
| Nickel based alloys | Inconel Hastelloy Waspalloy | Cutting speed(m/min) | 20 ~ 27 | 15 ~ 20 | 12 ~ 18 | 8 ~ 15 | 8 ~ 15 |
| | | Cutting rate(cm ² /min) | 7 ~ 20 | | | 5 ~ 15 | |
| Aluminum alloys, Aluminum cast alloys | A * * * * AC * * ADC ** | Cutting speed(m/min) | 80 ~ 150 (500 ~ 2000) | 80 ~ 150 (500 ~ 2000) | 80 ~ 150 (500 ~ 2000) | 60 ~ 80 | 60 ~ 80 |
| | | Cutting rate(cm ² /min) | 70 ~ 1500 | | | 70 ~ 1500 | |
| Copper alloys | C * * * * | Cutting speed(m/min) | 60 ~ 90 (100 ~ 150) | 60 ~ 90 (100 ~ 150) | 60 ~ 90 (100 ~ 150) | 40 ~ 60 | 40 ~ 60 |
| | | Cutting rate(cm ² /min) | 40 ~ 50 | | | 30 ~ 40 | |
| Graphitic carbon | | Cutting speed(m/min) | 70 ~ 90 (200 ~ 500) | 70 ~ 90 (200 ~ 500) | 70 ~ 90 (200 ~ 500) | 50 ~ 70 | 50 ~ 70 |
| | | Cutting rate(cm ² /min) | 45 ~ 60 | | | 40 ~ 50 | |
| Structural | | Cutting speed(m/min) | 50 ~ 80 | 50 ~ 80 | 50 ~ 80 | 45 ~ 65 | 45 ~ 65 |
| | | Cutting rate(cm ² /min) | 40 ~ 70 | | | 30 ~ 50 | |

The cutting Parameters suggested above are general guidelines. Fine tuning these parameters according to the work material, Type of Saw Blade and Sawing machine will result in best outcome.

Trouble-Shooting

| ITEM | COMPLAINT | CAUSE/ OBSERVATION | COUNTERMEASURES |
|--------------------------------|----------------------------------|--|--|
| Cutting Quality | Tapper Cutting | EXCESSIVE OR LOW BLADE TENSION | Maintain blade tension between 18 to 20 kgf/sq.mm.(25000 to 28000 PSI) |
| | | WORN OUT BEARINGS OR ROLLERS | Replace bearings / rollers which twist the blade to vertical position/ |
| | | GUIDES FAR FROM JOB | Place the moveable side arm closer to the work piece/job. |
| | | EXCESSIVE CUTTING FEED | Change the cutting feed as per recondition for the work material. |
| | | ABNORMAL WEAR ON BLADE | Change the cutting speed as per the recommendation for work material in the next blade. Remember to conduct breaking in of the teeth. |
| | | BAD SURFACE OF CARBIDE GUIDES | Check the three carbide guides and replace them if there is excessive wear. |
| | | JAWS HOLDING JOB ARE LOOSE | Check the jaw pressure and straightness with respect to the job and ensure firm positioning of work under the blade. |
| | Bad Surface Finish | LARGE TPI | Use suitable TPI as per recommendation for the shape and dimensions of job. |
| | | EXCESSIVE CUTTING FEED | Use recommended cutting feed as per the work material. Optimisation of feed may be required to achieve desired surface finish. |
| | | ABNORMAL WEAR ON BLADE | Improving cutting conditions and choosing the right grade and tooth profile of blade will reduce the wear and improve tool life. |
| Blade Damage | BLADE BREAKAGE | VIBRATIONS OF MACHINE OR BOW ARM | Machine may need over hauling. A stable and sturdy machine gives best blade performance. |
| | | EXCESSIVE CUTTING FEED | Use recommended cutting feed as per the work material. |
| | | EXCESSIVE BLADE TENSION | Maintain blade tension between 18 to 20 kgf/sq.mm.(25000 to 28000 PSI) |
| | | LOOSE CARBIDE GUIDES | Check the carbide guides and place them close to the blade but not tight. Guides can not restrict the movement of blade. |
| | | LOOSE JAWS HOLDING THE JOB | Jaws clamping the work piece must be firm and must hold the job in place tight. |
| | | CRACKING THE BACK OF BLADE | Check the carbide TOP guide and replace if required. The carbide guide must not have a groove. Periodic replacement of top guide will help better blade life. |
| | | CRACKING FROM THE GULLET OF BLADE | Smaller TPI and higher feed will result in cracking of blade from gullets. |
| | | BLADE SHEARING/SCRACHES ALONG THE LENGTH | Bearings and Rollers guiding the blade before guide arms may be adjusted to avoid shearing of blade. A straight mark along ghte length of the blade shows fatigue resulting out of bearings and rollers. |
| | | BLADE WEARING/SCRACHES ALONG THE LENGTH | Loosen the Carbide SIDE guides to ensure blade position on the job to be vertical. Replace them if required. |
| | | BLADE RUBBING ON THE COLAR OF THE WHEEL | Machine blade wheels need alignment. A well aligned set of wheels will give best tool life. |
| | CHIP BRUSH NOT WORKING OR ABSENT | A functional chip brush ensures clean blade entering the job every time. Its absense will result in inconsistant tool life.Machines with Motorised chipbrushes give best tool life and clean cuts. | |
| | Blade Teeth Ripping Off | EXCESSIVE CUTTING FEED | Excessive blade feed results in high impact load on the teeth and hence teeth break. One broken tooth initiates series of teeth breakages. Use Appropriate and recommended feed. |
| | | CHIP BRUSH NOT WORKING OR ABSENT | A tooth with a gullet filled with a chip, when enters the job, results in cracking of the blade from that gullet. Change the chip brush and ensure it is working. |
| | | CUTTING OIL ABSENT | Maintain 5% cutting oil concentration for Band Saw Machines. |
| | | TPI TOO BIG OR FEED TOO HIGH | Use suitable TPI as per recommendation for the shape, dimensions and Bundle size of job. |
| HYDRAULIC FEED UNEVEN | | Check the hydraulic cylinder and change the oil seals if required. any leakage in the hydraulic system will result in uneven feed of blade and jerks. | |
| TWISTING OF JOB DURING CUTTING | | This happens during bundle cutting when the jobs are not straight or Top Clamp of the Jaw is absent or loose. Take care not to have larger bundles or use straight jobs with firm top clamp near the jaws. | |
| VIBRATION OF THE MACHINE | | Grout the machine well, over haul the machine time to time, avoid blades with constant pitch, tighten the jaws holding the job, check mounting of motor and gear box. | |
| Others | Vibration and Noise | EXCESSIVE CUTTING SPEED | Reduce the blade speed till noise subsides. |
| | | EXCESSIVE BLADE WEAR | Use better grade of blade or use Wide Teeth blades if job is soft, |
| | | TPI TOO SMALL | Use recommended TPI or change to VL type. |

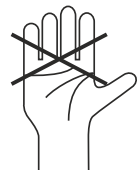
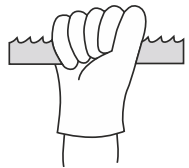
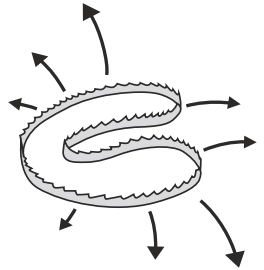
Attention on safety



Warning

Read this “Attention on safety”

- A bandsaw blades is dangerous. Be fully careful because it has danger when a saw edge is untied and spread.
- Use leather gloves in the installation and the removal of the bandsaw blades.
- Be sure to cut the main power supply of the machine when you replace a bandsaw blade.
- Fix work materials firmly.
- Never touch a bandsaw blades during the rotation.
- Read the instruction manual of the machine, and use it properly.
- Recommend running-in a bandsaw blade to achieve the full life.
- Use the cutting fluids fully which is suitable for work material.
- Be fully careful of the disposal of the bandaw blades which has been used.





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