



AZNK

TOOL TECHNOLOGIES

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ABOUT US

Azak Tool Technologies has been founded in 2018 as a result of observing the product needs in the market with the experience and knowledge of Ağır Haddecilik A.Ş gained in the sector over many years. Our company has based its activities on specializing in the field of cutting tools and supplying quality products to all world markets in this direction. After a few years of preliminary research, we started our production with the HSS circular saw product and we have already made good progress in our goal of being a worldwide known brand.

Our production facility was established on a total area of 45,000 m² in Dilovası Industrial Zone, which is 70 km away from Istanbul. We started our production in a closed area of 3,000 m² in the first place, and this figure reached a closed area of 8,600 m² with continued investments within 2 years. In the next 5 years, we aim to reach a closed working area of approximately 40,000 m².

Our production facility is equipped with latest technology machinery and equipment, including heat treatment furnaces, machines for various grinding processes, threading machines, coating machines and a fully equipped laboratory.

One of the main factor that directly affects performance of the product in cutting tool applications is the coating process. We are also working with universities on this issue in order to increase the high performance our coatings provided to our customers. In this context, we have come to a point where we can offer coating options specific to the processes of the end-users. As Azak Tool Technologies Inc., we approach the requirements of our customers from their point of view and carry out the necessary engineering studies together with our customers in order to make the product as practical and efficient as possible for them.

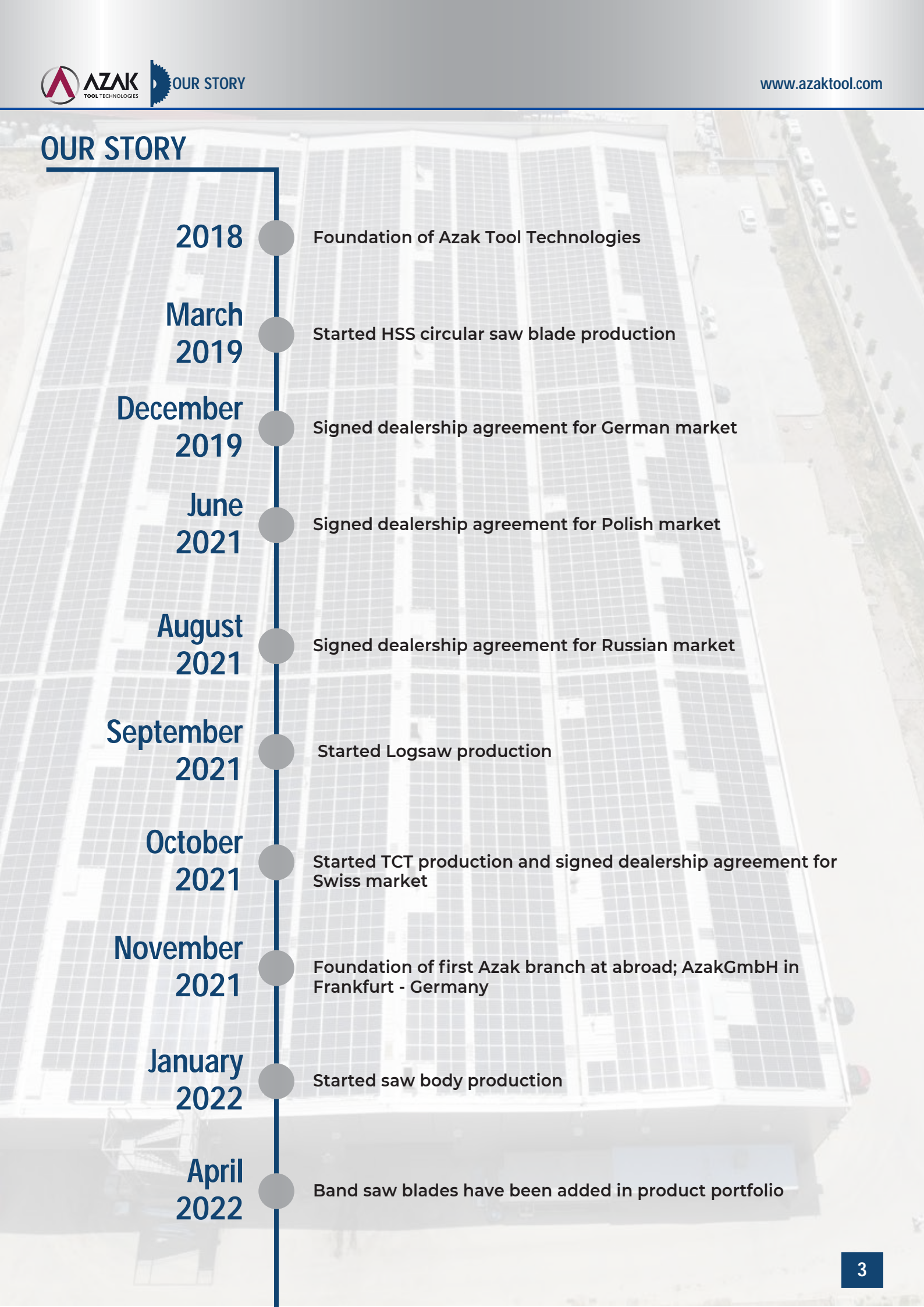
Today besides HSS circular saw blades, we have also started production of TCT saw blades, CrV (friction blades), Circular knives for various industries and the Saw bodies for metal and marble / stone cutting applications.

We currently employ a total of 100 personnel, 20 of whom are white collar workers. All of our staff are well-trained and experienced in their fields. We also have expert consultants from home and abroad.

As a company, we always carry out our work with the principle of "people first". In the light of this principle, we are aware that "Education" is the most important weapon we have in terms of ensuring life safety.



OUR STORY

- 
- 2018** Foundation of Azak Tool Technologies
 - March 2019** Started HSS circular saw blade production
 - December 2019** Signed dealership agreement for German market
 - June 2021** Signed dealership agreement for Polish market
 - August 2021** Signed dealership agreement for Russian market
 - September 2021** Started Logsaw production
 - October 2021** Started TCT production and signed dealership agreement for Swiss market
 - November 2021** Foundation of first Azak branch at abroad; AzakGmbH in Frankfurt - Germany
 - January 2022** Started saw body production
 - April 2022** Band saw blades have been added in product portfolio

CAPABILITIES

By communicating closely with our customers we can better understand their needs. It is our goal to develop products and services that provide solutions to these needs. For the correct use of our tools we support our customers not only as providers and adviser, we also accompany them as a competent partner through all stages in their business.

 **Training**

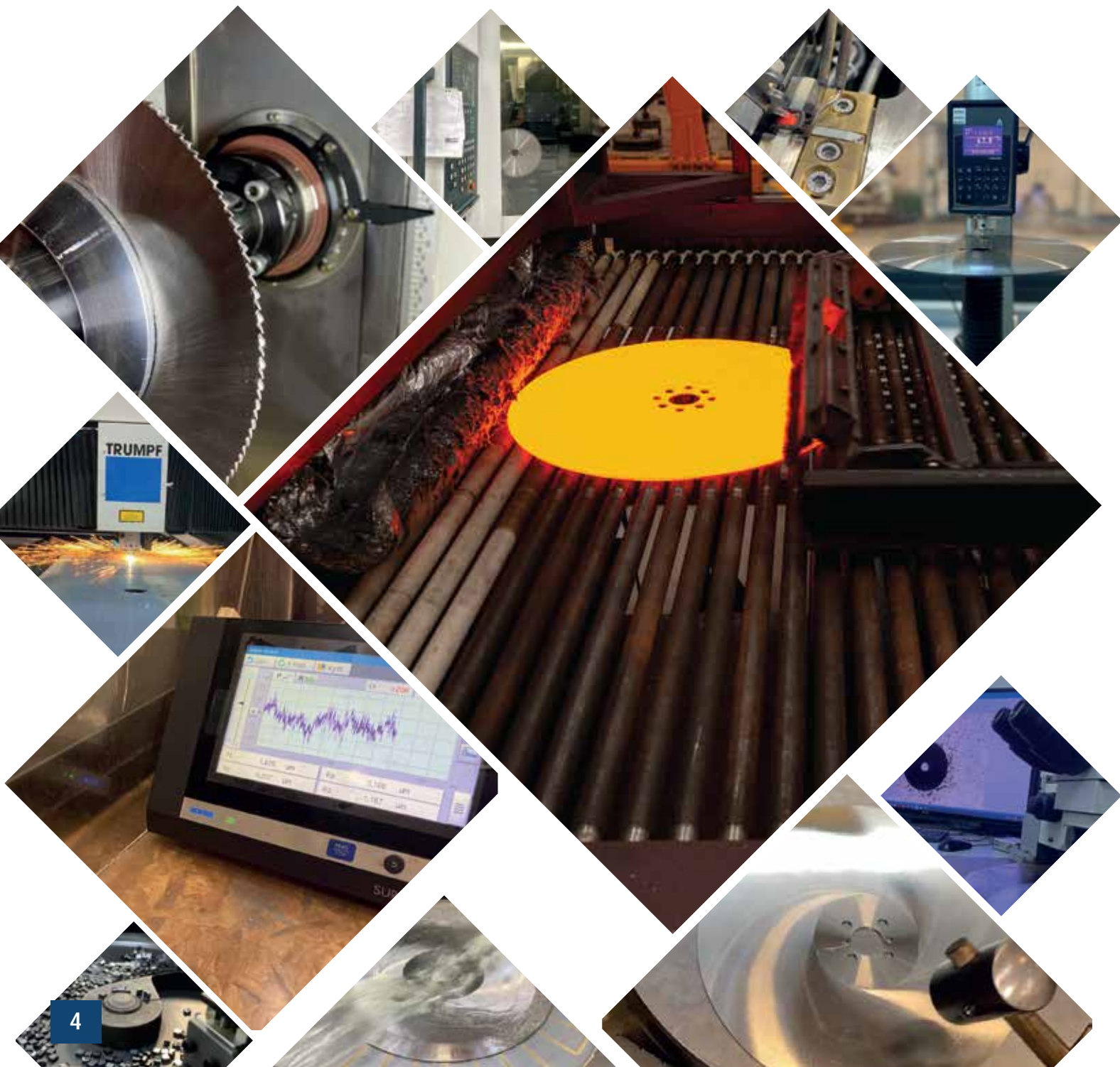
Basic of cutting technology 

 **Technical cutting workshops**

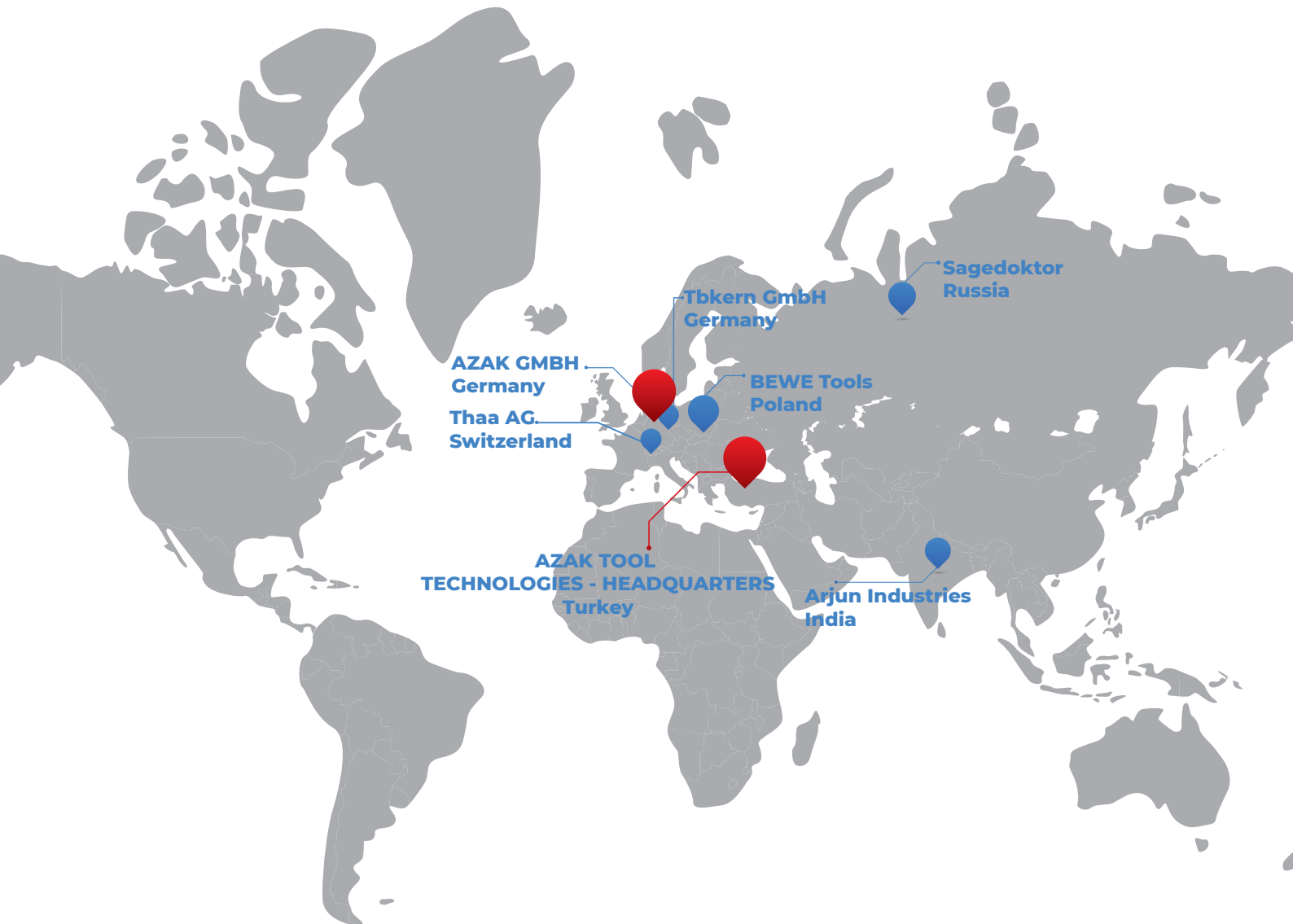
User-specific training 

 **Individual service concept**

Sharpening Service 



OUR DEALER NETWORK



AZAK TOOL TECHNOLOGIES - HEADQUARTERS

Address: Organize San. Bölgesi Mah. 4. Cad. No:8/1 Dilovası
Kocaeli, TURKEY
Phone: +90 262 999 60 01
Fax: +90 262 999 60 02
Email: sales@azaktool.com
Website: www.azaktool.com

AZAK TOOL GMBH

Address: Achtelsbergstr 4 97840 Hafenlohr-Windheim, GERMANY
Email: sales@azaktool.com
Website: www.azaktool.com

TBKERN GMBH

Address: Windheimer Str 7 97840 Hafenlohr, GERMANY
Phone: +49 9391 90 88 930
Website: www.tbkern.com

THAA AG SAGEWERKZEUGE SCHARFEREI

Address: Hauptstrasse 77CH-8552 Felben, SWITZERLAND
Phone: +41 (0) 52 765 22 12
Fax: +41 (0) 52 765 17 27
Website: www.thaa.ch

BEWE TOOLS POLSKA Sp. z o.o.

Address: Al. Walentego Roździeńskiego 188 H 40-203
Katowice, POLAND
Phone: +48 32 320 00 03
Fax: +48 32 745 17 01
Website: www.bewe-tools.pl

SAGEDOKTOR LLC

Address: Eniseykaya Str. 1 Office 3106 Ru-129344 Moscow,
RUSSIAN FEDERATION
Phone: +7 (495) 215-17-37 , +7 (931) 009-41-40
Email: info@sagedoktor.ru

ARJUN INDUSTRIES

Address: D-2 Block Midc Plot No-56/19 Chinchwad Haveli
Pune Maharashtra 411019 INDIA
Phone: +91 9657282871
Fax: +91 8446442301
Website: www.arjunindustries.in

HSS

SAW BLADES



**Increase your cutting performance
with Azak HSS Circular
Saw Blades**



HSS RAW MATERIALS

HSS/Dmo5 | DIN 1.3343 | AISI M2 | JIS SKH51

High speed with Tungsten-Molybdenum. After heat treatment, these elements ensure good hardness and toughness. High cutting performance, reduce tool wear, high mechanic resistance are the advantages of this type steel

| Chemical Composition % | | | | | | | | | |
|------------------------|--------|--------|---------|---------|----|-----------|-----------|-----------|-----------|
| C | Si | Mn | P | S | Co | Cr | Mo | V | W |
| 0,86-0,94 | ≤ 0,45 | ≤ 0,40 | ≤ 0,030 | ≤ 0,030 | - | 3,80-4,50 | 4,70-5,20 | 1,70-2,00 | 6,00-6,70 |

HSS/Emo5-Co5 | DIN 1.3243 | AISI M35 | JIS SKH55

High speed with Tungsten (%6,4)-Molybdenum (%5) and Cobalt (%4,8). Cobalt in the structure of metal, ensures excellent hardness at high operating temperatures by avoiding grain growth. It is used for cutting stainless steels and extra hard metals.

| Chemical Composition % | | | | | | | | | |
|------------------------|--------|--------|---------|---------|----------|-----------|-----------|-----------|-----------|
| C | Si | Mn | P | S | Co | Cr | Mo | V | W |
| 0,88-0,96 | ≤ 0,45 | ≤ 0,40 | ≤ 0,030 | ≤ 0,030 | 4,5-5,00 | 3,80-4,50 | 4,70-5,20 | 1,70-2,00 | 6,00-6,70 |

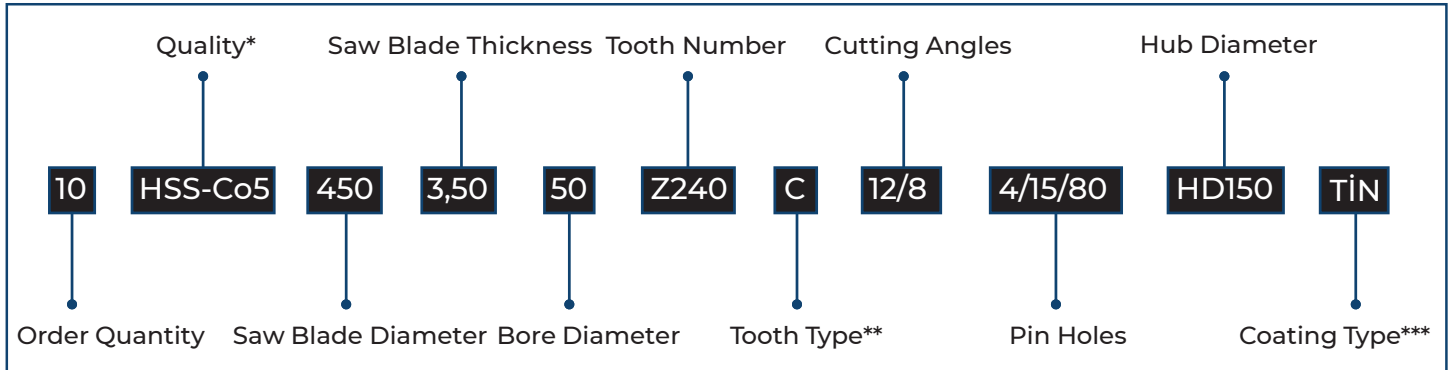
ASP 2052 | DIN 1.3253

S390 PM: Obtained by sintering with powder metalurgy. Significantly reduced blade tension. Because of obtaining by sintering, it has high degree homogeneity. These features gives lower razoredge wear, greater tool toughness, increased hardness.

| Chemical Composition % | | | | | | | | | | |
|------------------------|------|------|-------|-------|------|------|------|------|-------|------|
| C | Si | Mn | P | S | Co | Cr | Mo | V | W | Ni |
| 1,63 | 0,30 | 0,26 | 0,018 | 0,018 | 8,32 | 4,91 | 2,28 | 5,12 | 10,09 | 0,20 |



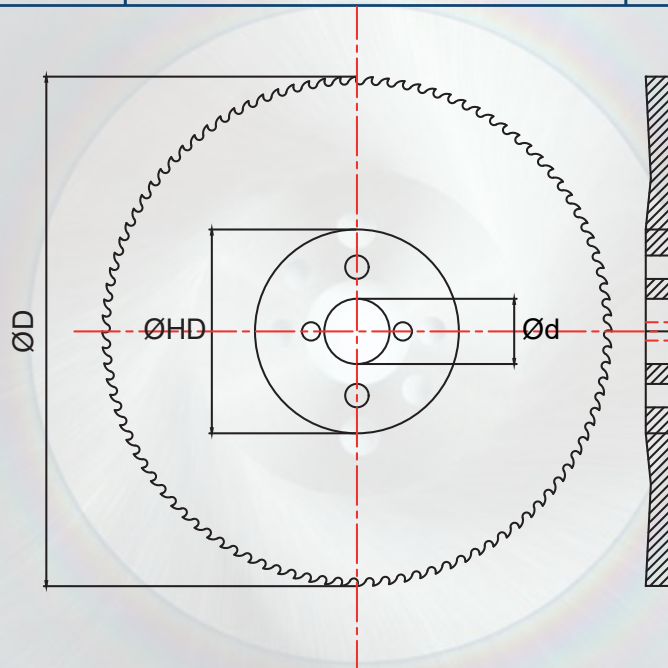
ORDER DESIGNATION



10-HSS-Co5-450-3,50-50-Z240-C-12/8-4/15/80-HD150-TiN

HSS-Co5 quality-450 mm diameter- 3,50 saw thickness- 50 mm bore diameter-240 number of teeth C type- 4/15/80 pin holes- 150 mm flange diameter- TiN coating- 10 pieces Circular Saw Blades

| QUALITY | TOOTH TYPE | COATING TYPE |
|-------------|------------|---------------|
| HSS | 0:None | Bright Finish |
| HSS-Co5 | A | OXY |
| ASP2052 | B | TiN |
| HSS-DIN1838 | C | TiCN GREY |
| HSS-DIN1837 | AW | TiCN RED |
| | BR | TiAlN |
| | BW | AlTiN |
| | VP | AlTiCrN |
| | | ML-TiAlN |
| | | ML-ALTiN |



STRUCTURE OF CIRCULAR SAW BLADES

Tooth

This is the most important part of the blade which performs the cutting process.

Gullet

Gullet, spaces between teeth, allows the chips remove easily.

Clearance Angle

α

Cutting

γ

Uncoated part of saw body

The body of the saw blades with coating. Resharpener is possible up to end of the coating.

Pinholes

The pinholes for the sawing machine. It allows the guiding of the blade on the machine.

Bore

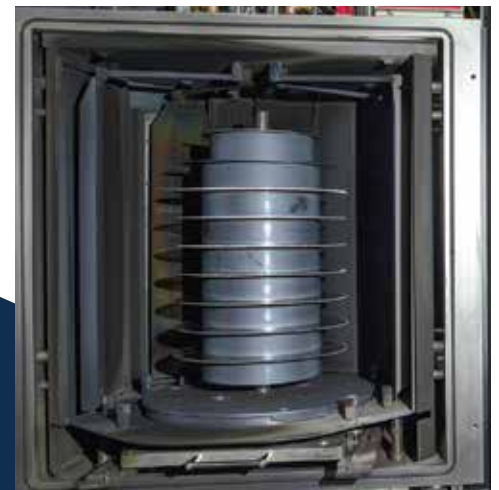
This hole is used for mouting the saw blade to the machine.

Hub

The thicker part of the blade. It is used for mounting blade to the sawing machine.

WHAT IS PVD (PHYSICAL VAPOR DEPOSITION)?

PVD (physical vapor deposition) coating, also known as thin-film coating, is a process in which a solid material is vaporized in a vacuum and deposited onto the surface of a part. These coatings are not simply metal layers though. Instead, compound materials are deposited atom by atom, forming a thin, bonded, metal or metal-ceramic surface layer that greatly improves the appearance, durability, and/or function of a part or product. Here at AZAK, your saw blade coating is developed by our engineers for your exacting needs and can be easily customized to change the color, durability, or other characteristics of the coating



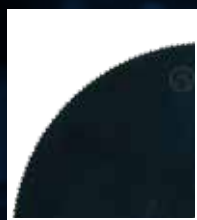
Coating Process

The arc evaporation process begins with the striking of a high current, low voltage arc on the surface of a cathode (known as the target) that gives rise to a small (usually a few micrometers wide), highly energetic emitting

area known as a cathode spot. The localised temperature at the cathode spot is extremely high (around 15000 °C), which results in a high velocity (10 km/s) jet of vapourised cathode material, leaving a crater behind on the cathode surface. The cathode spot is only active for a short period of time, then it self-extinguishes and re-ignites in a new area close to the previous crater. This behaviour causes the apparent motion of the arc.

As the arc is basically a current carrying conductor it can be influenced by the application of an electromagnetic field, which in practice is used to rapidly move the arc over the entire surface of the target, so that the total surface is eroded over time

COATING TYPES



OXY

It is used for only cutting steel materials. Suitable for cutting structural steels, alloyed steels, medium hardness steel tubes and pipes, not used for cutting bronze, copper and brass materials.

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|-------------------|-------------------------|--------------------------|
| 700 HV | 2-4 μm | 0.6 | 550 $^{\circ}\text{C}$ |



TIN

It is suitable for cutting low-alloy structural steels, medium hardness steel tubes and pipes and non-ferrous tubes and pipes. However not used for soft materials like copper, brass and bronze

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|--------------------|-------------------------|--------------------------|
| 2650 HV | 1-10 μm | 0.4 | 600 $^{\circ}\text{C}$ |



TiCN GREY

This coating is used for cutting highly abrasive materials such as stainless steel and medium alloyed steels with a hardness of up to 800 N/mm². The low friction coefficient considerably reduces chipping at the cutting edge and the disc sidewall.

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|-------------------|-------------------------|--------------------------|
| 3800 HV | 1-4 μm | 0.25 | 450 $^{\circ}\text{C}$ |



TiCN RED

It is particularly used for cutting stainless steel, titanium, hardened steel as well as brass and copper.

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|-------------------|-------------------------|--------------------------|
| 3800 HV | 1-4 μm | 0.25 | 450 $^{\circ}\text{C}$ |



AlTiN

Aluminum Titanium Nitride coating is suitable for cutting extra hard steels, aluminum-silicon alloys, titanium alloys, copper, brass. Otherwise, this coating is suitable for high temperature applications due to low thermal conductivity.

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|-------------------|-------------------------|--------------------------|
| 3800 HV | 1-4 μm | 0.6 | 900 $^{\circ}\text{C}$ |

COATING TYPES



TiAlN

It has an oxidation temperature of 700°C resulting in a surface hardness of 3.600 Vickers. The friction coefficient is 0,5 and allows circular saws to be used with excellent results even in conditions of limited or minimal lubrication and misting. It is particularly suited to high alloy steels of up to 1100 N/mm², cutting cast iron, stainless steel and all materials that develop considerable heat.

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|-----------|-------------------------|--------------------------|
| 3600 HV | 1-5 µm | 0.5 | 700 °C |



ML-TiAlN

In the TiAlN multilayer coating, the metallic ratio is 50% aluminum and 50% titanium. Mechanical properties such as film toughness, impact resistance and strength are better in titanium-rich TiAlN coatings. TiAlN coatings should be preferred when high toughness, better surface properties and impact resistance are required. In addition, TiAlN-ML coatings perform much better for dry cutting.

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|-----------|-------------------------|--------------------------|
| 3800 HV | 1-4 µm | 0,55 | 800°C |



ML-ALTiN

In the ALTiN multilayer coating, the metallic ratio is 67% aluminum and 33% titanium. Aluminum-rich ALTiN coatings have higher high temperature resistance, high temperature oxidation resistance and wear resistance. Thanks to its multilayer layer structure, it resists crack growth and maximizes the service life of the saw. In cases where high hardness and temperature resistance are required, ALTiN-ML coatings should be preferred.

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|-----------|-------------------------|--------------------------|
| 3300 HV | 1-4 µm | 0,6 | 900 °C |

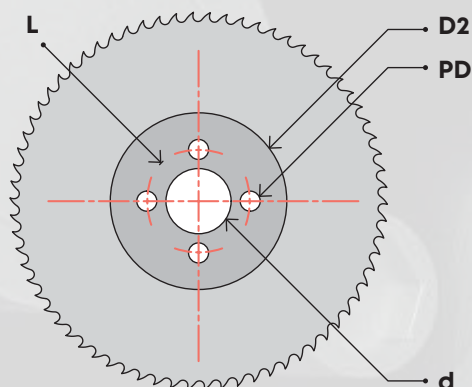


ALTiCrN

This coating is very tenacious and resistant to high temperatures but, it differs from other coatings because it doesn't need to reach high temperatures to obtain the best performances. It is highly recommended for high speed cuts with critical cutting parameters, where the performance losses due to the cutting speed increase is sensibly lower than with other traditional coating. The friction coefficient is 0,45 and this permits to use the circular saws both when cutting without or with low cooling or or when cutting with plenty of cooling. It's suggested when cutting high alloyed steels up to 1000 N/mm², stainless steel and all material developing a high thermal energy.

| Hardness | Thickness | Coefficient of friction | Max. Working Temperature |
|----------|-----------|-------------------------|--------------------------|
| 3800 HV | 1-5 µm | 0.5 | 900 °C |

SAW BLADE STANDARD DIMENSIONS



Sample Measurement

4/12/64 → L
→ PD
→ Pin Hole Qty.

D2 Hub Diameter

PD Pin Hole Diameter

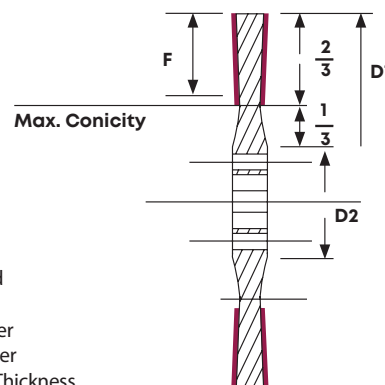
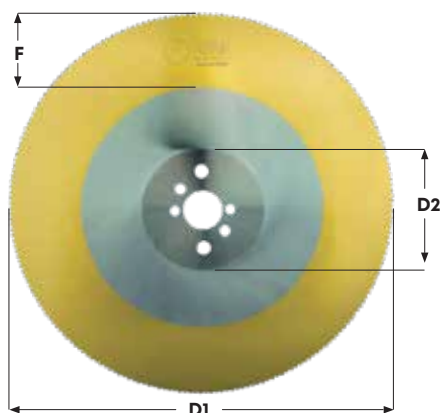
L Pin Hole Axis

d Bore Diameter

| Saw Blades Diameter (D1) | Bore Diameter (d) | Hub Diameter (d2) | Thickness (B) | Standard Pin Holes (PD) |
|--------------------------|-------------------|-------------------|------------------------------------|-------------------------|
| 160 | 32 | 75 | 1,20/1,50/2,00 | 2/8/45+2/11/63 |
| 175 | 32 | 75 | 1,20/1,50/2,00 | 2/8/45+2/11/63 |
| 200 | 32 | 90 | 1,00/1,20/1,50/1,80/2,00/2,50 | 2/8/45+2/11/63 |
| 210 | 32 | 90 | 2,00 | 2/8/45+2/11/63 |
| 225 | 32 | 100 | 1,00/1,20/1,50/1,80/2,00/2,50 | 2/8/45+2/11/63 |
| | 40 | 100 | 1,80/2,00/2,50 | 2/8/55+4/12/64 |
| 250 | 32 | 100 | 1,00/1,20/1,50/1,80/2,00/2,50/3,00 | 2/8/45+2/11/63+2/9/50 |
| | 40 | 100 | 2,00/2,50/3,00 | 2/8/55+4/12/64 |
| 275 | 32 | 100 | 1,20/1,50/1,80/2,00/2,50/3,00 | 2/8/45+2/11/63+2/9/50 |
| | 40 | 100 | 1,60/2,00/2,50/3,00 | 2/8/55+4/12/64 |
| 300 | 32 | 100 | 1,60/2,00/2,50/3,00 | 2/8/45+2/11/63+2/9/50 |
| | 40 | 100 | 1,60/2,00/2,50/3,00 | 2/8/55+4/11/64 |
| 315 | 32 | 100 | 1,60/2,00/2,50/3,00/3,50 | 2/8/45+2/11/63+2/9/50 |
| | 40 | 100 | 1,60/2,00/2,50/3,00/3,50 | 2/8/55+4/12/64 |
| 325 | 32 | 120 | 2,00/2,50/3,00 | 2/8/45+2/11/63 |
| | 40 | 120 | 2,00/2,50/3,00 | 2/8/55+4/12/64 |
| 350 | 32 | 120 | 1,80/2,00/2,50/3,00/3,50 | 2/8/45+2/11/63+2/9/50 |
| | 40 | 120 | 1,80/2,00/2,50/3,00/3,50 | 2/8/55+4/12/64 |
| | 50 | 120 | 1,80/2,00/2,50/3,00/3,50 | 4/15/80+4/14/85 |
| 370 | 32 | 120 | 2,50/3,00 | 2/8/45+2/11/63 |
| | 40 | 120 | 2,50/3,00/3,50 | 2/8/55+4/12/64 |
| | 50 | 120 | 2,50/3,00 | 4/15/80+4/14/85 |
| 400 | 40 | 120 | 2,50/3,00/3,50 | 2/8/55+4/12/64 |
| | 50 | 120 | 2,50/3,00/3,50/4,00 | 4/15/80+4/14/85 |
| 425 | 40 | 120 | 2,50/3,00/3,50 | 2/8/55+4/12/64 |
| | 50 | 120 | 2,50/3,00/3,50/4,00 | 4/15/80+4/14/85 |
| 450 | 40 | 130 | 2,50/3,00/3,50/4,00 | 2/8/55+4/12/64 |
| | 50 | 130 | 2,50/3,00/3,50/4,00 | 4/15/80+4/14/85 |
| 500 | 40 | 130 | 3,00/3,50/4,00/5,00 | 2/8/55+4/12/64 |
| | 50 | 130 | 3,00/3,50/4,00/5,00 | 4/15/80+4/14/85 |
| 525 | 50 | 140 | 3,50/4,00 | 4/15/80+4/14/85 |
| 550 | 50 | 140 | 3,50/4,00/5,00 | 4/15/80+4/14/85 |
| | 90 | 200 | 4,00/5,00 | 3/12,5/160 |
| | 140 | 225 | 4,00/5,00 | 4/17,5/170 |
| 570 | 50 | 180 | 4,00/5,00 | 4/15/80+4/14/85 |
| 600 | 50 | 200 | 4,00/5,00 | 4/15/80+4/14/85 |
| | 90 | 200 | 4,00/5,00 | 3/12,5/160 |
| | 140 | 225 | 4,00/5,00 | 4/17,5/170 |
| 630 | 50 | 225 | 4,00/5,00 | 4/14/85+4/15/80 |
| | 80 | 225 | 4,00/5,00 | 4/23/120 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

SAW BLADE STANDARD DIMENSIONS



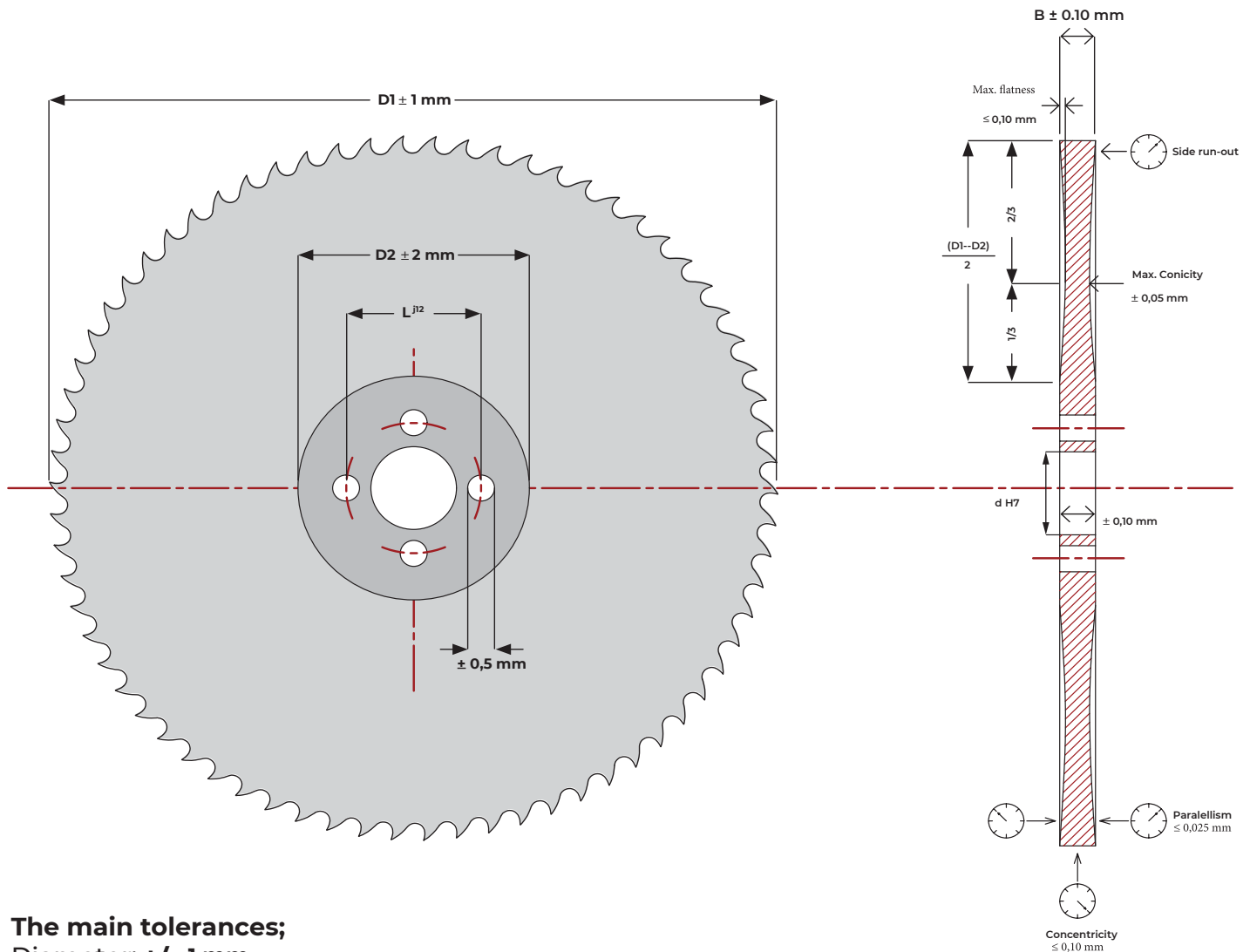
Symbols

- F** : Coated Band
- D1** : Diameter
- D2** : Hub Diameter
- d** : Bore Diameter
- B** : Saw Blades Thickness

The dimensional tolerances of circular saws are determined by the DIN 1840 standard. In the tables and drawing below you can find the saw blade dimensions, hub diameters, cutting depth, conicity, run-out values and tolerances of the main dimensions.

| D1 Dimensions (mm) | D2 Hub (mm) | B (mm) | Run-Out Standard (mm) | F Coated Band (mm) | D1 Dimensions (mm) | D2 Hub Diameter (mm) | B (mm) | Run-Out Standard (mm) | F Band Coated (mm) |
|--------------------|-------------|---------|-----------------------|--------------------|--------------------|----------------------|--------|-----------------------|--------------------|
| 160 | 75 | 1,2 | 0,20 | | 325 | 120 | 2,5 | 0,25 | 60 |
| 160 | 75 | 1,5 | 0,20 | 25 | 325 | 120 | 3,0 | 0,25 | 60 |
| 160 | 75 | 2,0 | 0,20 | 25 | 350 | 120 | 1,8 | 0,25 | 60 |
| 175 | 75 | 1,2 | 0,20 | 35 | 350 | 120 | 2,0 | 0,25 | 60 |
| 175 | 75 | 1,5 | 0,20 | 35 | 350 | 120 | 2,5 | 0,25 | 60 |
| 175 | 75 | 2,0 | 0,20 | 35 | 350 | 120 | 3,0 | 0,25 | 60 |
| 200 | 90 | 1,0 | 0,20 | 37 | 370 | 120 | 2,5 | 0,30 | 65 |
| 200 | 90 | 1,2 | 0,20 | 37 | 370 | 120 | 3,0 | 0,30 | 65 |
| 200 | 90 | 1,5/1,6 | 0,20 | 37 | 370 | 120 | 3,5 | 0,30 | 65 |
| 200 | 90 | 1,8 | 0,20 | 37 | 400 | 130x2,5 | 2,2 | 0,30 | 65 |
| 200 | 90 | 2,0 | 0,20 | 37 | 400 | 120 | 2,5 | 0,30 | 65 |
| 200 | 90 | 2,5 | 0,20 | 37 | 400 | 120 | 3,0 | 0,30 | 65 |
| 225 | 100 | 1,2 | 0,20 | 38 | 400 | 120 | 3,5 | 0,30 | 65 |
| 225 | 90 | 1,5/1,6 | 0,20 | 38 | 400 | 120 | 4,0 | 0,30 | 65 |
| 225 | 90 | 1,8 | 0,20 | 38 | 425 | 120 | 2,5 | 0,30 | 77 |
| 225 | 90 | 1,9/2,0 | 0,20 | 38 | 425 | 120 | 3,0 | 0,30 | 77 |
| 225 | 90 | 2,5 | 0,20 | 38 | 425 | 120 | 3,5 | 0,30 | 77 |
| 250 | 100 | 1,0 | 0,20 | 50 | 425 | 120 | 4,0 | 0,30 | 77 |
| 250 | 100 | 1,2 | 0,20 | 50 | 450 | 130 | 2,5 | 0,30 | 70 |
| 250 | 100 | 1,5/1,6 | 0,20 | 50 | 450 | 130 | 3,0 | 0,30 | 70 |
| 250 | 100 | 2,0 | 0,20 | 50 | 450 | 130 | 3,5 | 0,30 | 70 |
| 250 | 100 | 2,5 | 0,20 | 50 | 450 | 130 | 4,0 | 0,30 | 70 |
| 250 | 100 | 3,0 | 0,20 | 50 | 500 | 130 | 3,0 | 0,30 | 95 |
| 275 | 100 | 1,2 | 0,25 | 50 | 500 | 130 | 3,5 | 0,30 | 95 |
| 275 | 100 | 1,6 | 0,25 | 50 | 500 | 130 | 4,0 | 0,30 | 95 |
| 275 | 100 | 2,0 | 0,25 | 50 | 525 | 140 | 3,5 | 0,35 | 77 |
| 275 | 100 | 2,5 | 0,25 | 50 | 525 | 140 | 4,0 | 0,35 | 77 |
| 275 | 100 | 3,0 | 0,25 | 50 | 550 | 200/225 | 3,0 | 0,35 | 90 |
| 300 | 100 | 1,6 | 0,25 | 50 | 550 | 140/200/225 | 3,5 | 0,35 | 90 |
| 300 | 100 | 2,0 | 0,25 | 50 | 550 | 140/200/225 | 4,0 | 0,35 | 90 |
| 300 | 100 | 2,5 | 0,25 | 50 | 600 | 225 | 3,5 | 0,35 | 90 |
| 300 | 100 | 3,0 | 0,25 | 50 | 600 | 200/225 | 4,0 | 0,35 | 90 |
| 315 | 100 | 1,6 | 0,25 | 57 | 620 | 225 | 3,5 | 0,35 | 100 |
| 315 | 100 | 1,8 | 0,25 | 57 | 620 | 225 | 4,0 | 0,35 | 100 |
| 315 | 100 | 2,0 | 0,25 | 57 | 650 | 225 | 4,0 | 0,40 | 100 |
| 315 | 100 | 2,5 | 0,25 | 57 | 650 | 225 | 5,0 | 0,40 | 100 |
| 315 | 100 | 3,0 | 0,25 | 57 | 700 | 225 | 4,0 | 0,40 | 100 |
| 325 | 120 | 2,0 | 0,25 | 60 | 700 | 225 | 5,0 | 0,40 | 100 |

TECHNICAL INFORMATION AND CLEARANCE



The main tolerances;

Diameter: $\pm 1 \text{ mm}$

Hub Diameter: $\pm 2 \text{ mm}$

Pin Diameter: $\pm 0,5 \text{ mm}$

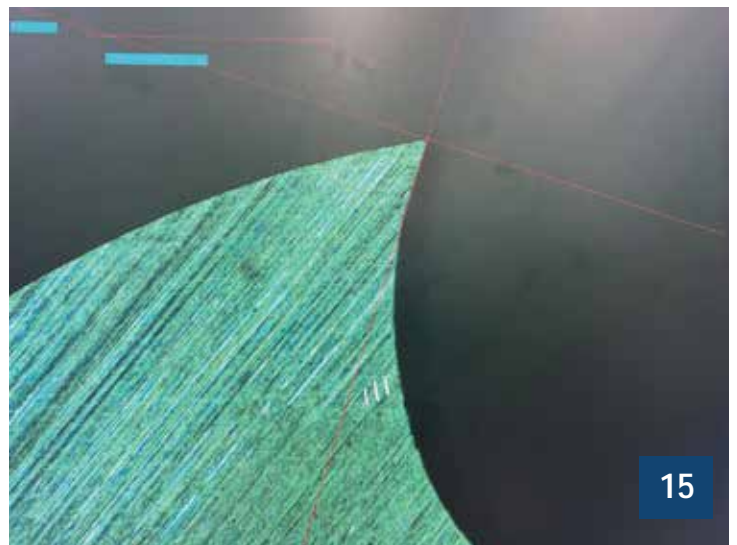
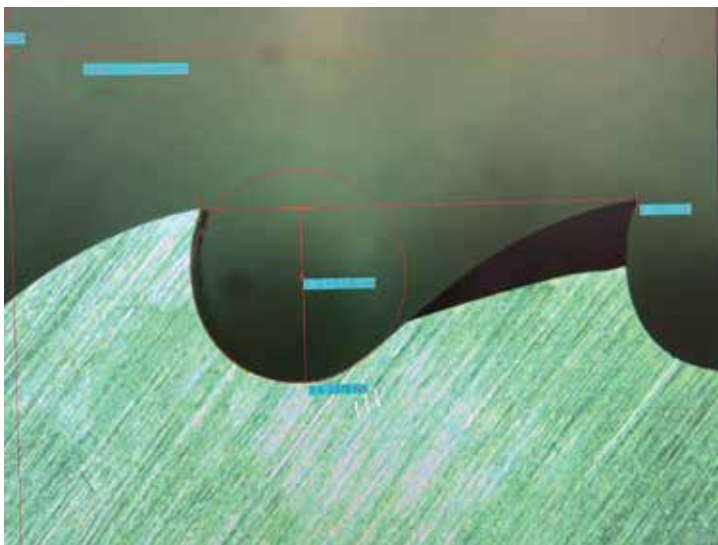
Pin Axis Diameter: **ISO j12**

Bore Diameter: **ISO H7**

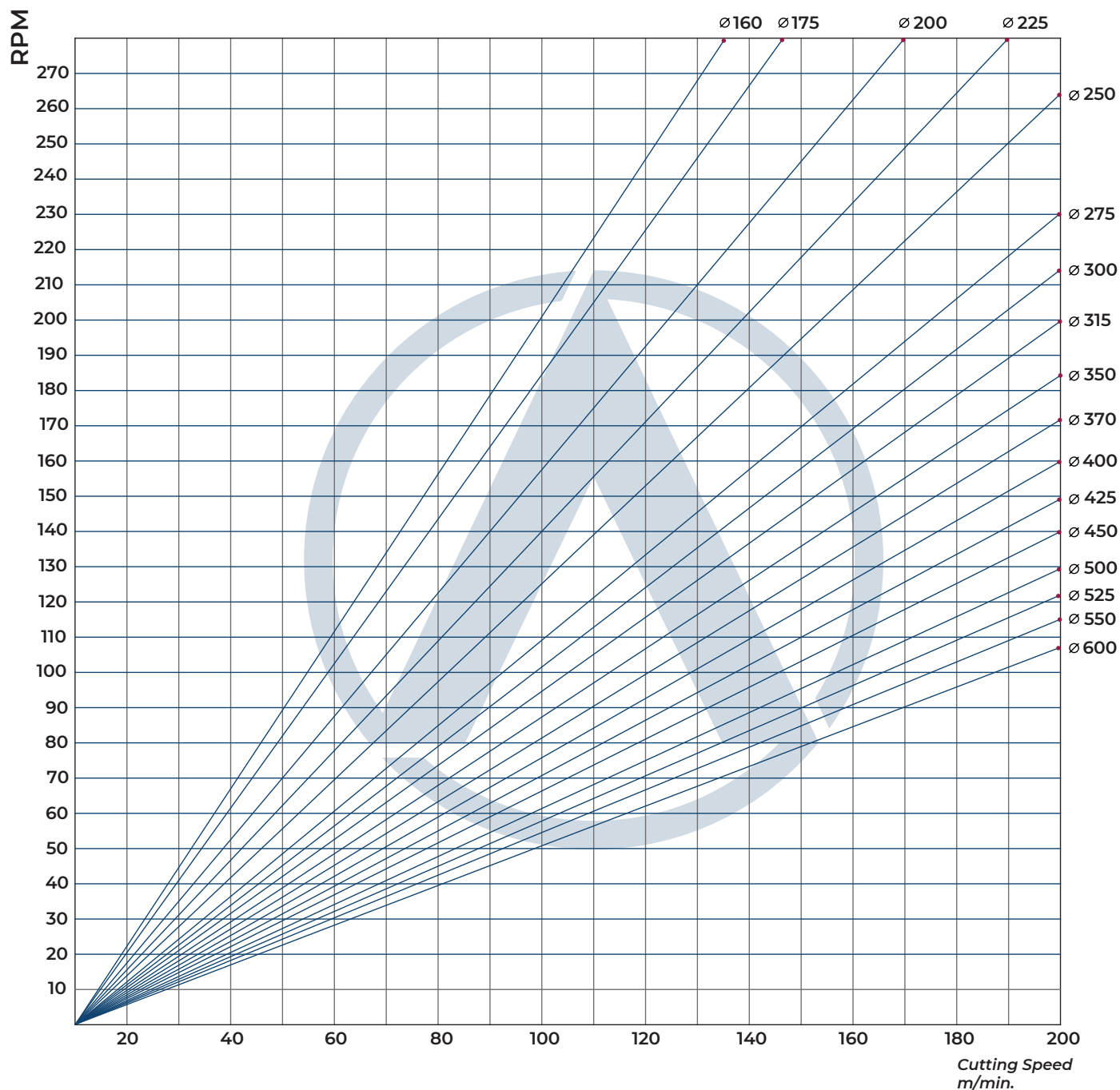
Diametral runout: Lower than $\pm 0,02 \text{ mm}$

Lateral runout changes according to the diameter of the blade but it is below **0,25 mm**

Conicity changes according to the diameter of the blade within tolerance of $\pm 0,05 \text{ mm}$



TECHNICAL INFORMATION / CUTTING SPEED



"The information given in the table are the standard values. We ask you to contact us in case of special requests."

- V** Cutting speed (m/min)
- D1** Saw blade diameter (mm)
- Av** Feed rate (mm/min): Speed of the saw blade in the material
- AvZ** Feed rate per tooth (mm/Z)
- Z** Number of teeth
- rpm** Number of revolutions per minute

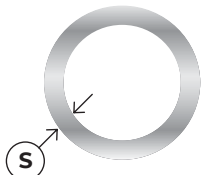
Formulas

$$\text{rpm} = V \times 1000 / D1 \times 3,14$$

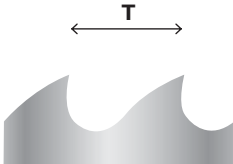
$$Av = AvZ \times Z \times \text{rpm}$$

TECHNICAL INFORMATION / CUTTING SELECTION

Pipe And Hollow Sections



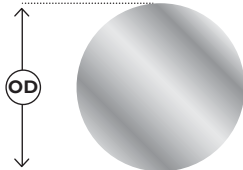
T: Tooth Pitch



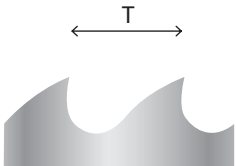
| S | < 1 mm | 1,1-1,5 | 1,6 - 2 | 2,1 - 3 | 3,1 - 4 | > 4 mm |
|------------------|--------|---------|---------|---------|---------|--------|
| Steel <500 N/mm | 3 | 4 | 5 | 5 | 6 | 7 |
| Steel <800 N/mm | 3 | 4 | 4 | 5 | 6 | 7 |
| Steel <1200 N/mm | 3 | 3 | 4 | 5 | 6 | 7 |
| Stainless Steel | 3 | 4 | 5 | 5 | 6 | 6 |
| Aluminium | 4 | 5 | 6 | 7 | 8 | 8 |
| Brass | 4 | 5 | 6 | 7 | 8 | 8 |
| Copper | 4 | 5 | 6 | 7 | 8 | 8 |
| Bronze | 4 | 5 | 6 | 7 | 8 | 9 |
| Titanium | 3 | 3 | 4 | 5 | 5 | 6 |
| Inconel | 3 | 3 | 4 | 5 | 5 | 6 |
| Zinc Alloy | 3 | 3 | 4 | 5 | 5 | 6 |

"The information given in the table is standard values. We ask you to contact regarding your special requests."

Solid Bar



T: Tooth Pitch

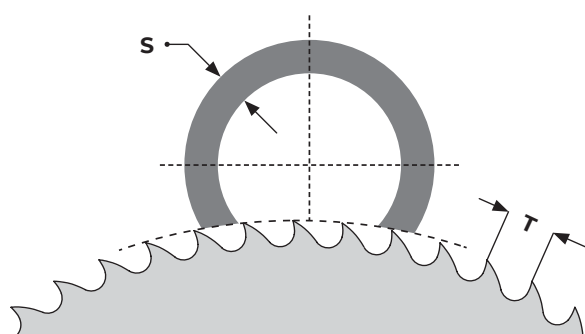


| S | 10-20 | 21-40 | 41-60 | 61-80 | 81-110 | 111-130 | 131-150 |
|------------------|-------|-------|-------|-------|--------|---------|---------|
| Steel <500 N/mm | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| Steel <800 N/mm | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| Steel <1200 N/mm | 5 | 7 | 9 | 12 | 14 | 16 | 18 |
| Stainless Steel | 5 | 7 | 9 | 12 | 14 | 16 | 18 |
| Aluminium | 8 | 9 | 12 | 16 | 18 | 18 | 18 |
| Brass | 8 | 10 | 12 | 14 | 18 | 18 | 18 |
| Copper | 8 | 10 | 10 | 14 | 18 | 18 | 18 |
| Bronze | 7 | 10 | 10 | 14 | 16 | 16 | 18 |
| Titanium | 5 | 6 | 8 | 10 | 12 | 14 | 14 |
| Inconel | 5 | 6 | 8 | 10 | 12 | 14 | 14 |
| Zinc Alloy | 5 | 6 | 10 | 12 | 14 | 16 | 16 |
| Cast Iron | 6 | 8 | 10 | 14 | 16 | 18 | 18 |

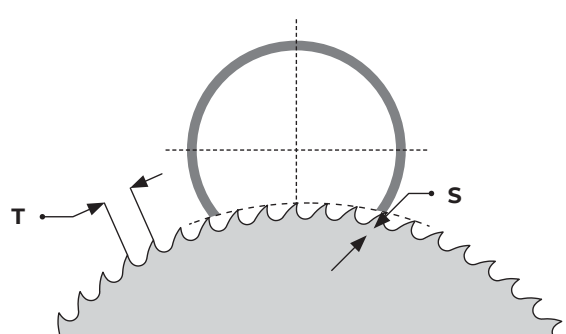
"The information given in the table are the standard values. We ask you to contact us in case of special requests."

TECHNICAL INFORMATION / PITCH SELECTION

Hollow Section Tube



RIGHT Tooth Pitch $2S > T$

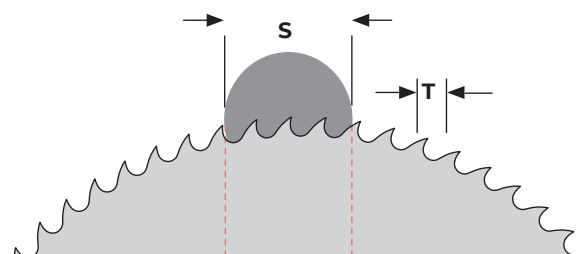


WRONG Tooth Pitch $2S < T$

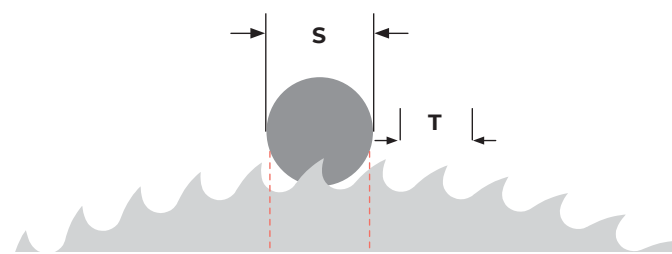
The right pitch should be smaller than 2 times the thickness of the section to be cut for pipe cutting. It is valid for general applications.

We recommend that you contact our technical team for special material quality and tests.

Solid Bar



RIGHT Tooth Pitch $S > 3T$



WRONG Tooth Pitch $S < 3T$

Three times the recommended pitch value for filling material cutting should be smaller than the thickness of the product to be cut. It is valid for general applications. We recommend that you contact our technical team for special material quality and cutting conditions.

"The information given in the table are the standard values. We ask you to contact us in case of special requests."









TECHNICAL INFORMATION / FEED RATE & COATING TYPES

In the preceding table, in addition to the cutting speed, we also find the recommended values for feed per tooth (Az), which allow us to calculate the total feed to be set on the machine.

The formula is as follows:

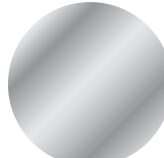







$$A = Az \times Z \times \text{RPM} \quad A / \text{Feed speed (mm/min)} \quad Z / \text{Number of teeth}$$

PIPE AND HOLLOW SECTIONS

|  |  Feed rate (mm/Z) min-max |  OXY |  TiN |  TiCN GREY |  TiCN RED |  TiAlN (ML-TiAlN) |  AlTiN (ML-AlTiN) |  AlTiCrN |
|---|---|---|---|--|--|---|---|---|
| Steel <500 N/mm | 0,03-0,10 | 70-230 | 70-230 | 70-230 | 70-230 | 95-240 | 70-230 | |
| Steel <800 N/mm | 0,03-0,09 | 45-135 | 45-135 | 45-135 | 45-140 | 65-160 | 45-140 | |
| Steel <1200 N/mm | 0,025-0,07 | 25-80 | 25-80 | 25-80 | 25-100 | 40-110 | 25-100 | |
| Stainless Steel | 0,025-0,06 | 15-70 | 15-70 | 15-70 | 15-80 | 20-90 | 15-80 | |
| Aluminium | 0,03-0,07 | 1000-1600 | 1000-1600 | 1000-1600 | 1000-1600 | 1000-1600 | 90-1600 | 1000-1600 |
| Brass | 0,04-0,08 | | 400-600 | 400-600 | 400-600 | 400-600 | 90-550 | 400-600 |
| Copper | 0,04-0,06 | | 200-300 | 200-300 | 200-300 | 200-300 | 90-300 | 200-300 |
| Bronze | 0,04-0,06 | | 200-400 | 200-400 | 200-400 | 200-400 | 90-400 | 200-400 |
| Titanium | 0,02-0,06 | | | | 15-30 | 15-45 | | |
| Inconel | 0,025-0,06 | | | | 15-45 | 20-50 | | |
| Zinc Alloy | 0,025-0,06 | 30-100 | 30-100 | 30-100 | 30-100 | 45-100 | 30-100 | |
| Cast Iron | 0,04-0,05 | 30-65 | 30-65 | 30-65 | 30-65 | 30-65 | 30-50 | |

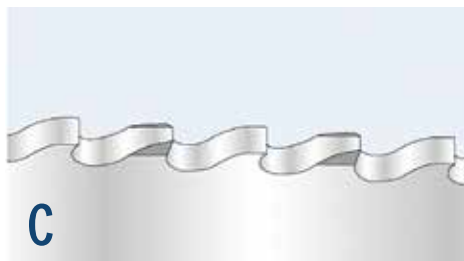
"The information given in the table are the standard values. We ask you to contact us in case of special requests."

SOLID

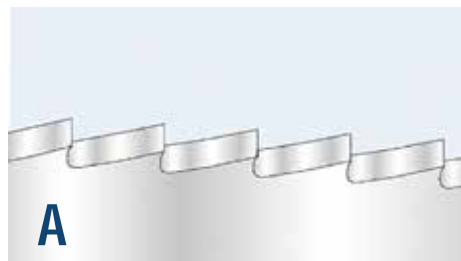
|  |  Feed rate (mm/Z) min-max |  OXY |  TiN |  TiCN GREY |  TiCN RED |  TiAlN (ML-TiAlN) |  AlTiN (ML-AlTiN) |  AlTiCrN |
|---|---|---|---|--|--|---|---|---|
| Steel <500 N/mm | 0,025-0,08 | 30-115 | 30-115 | 30-115 | 30-115 | 30-120 | 30-115 | |
| Steel <800 N/mm | 0,025-0,07 | 25-70 | 25-70 | 25-70 | 25-70 | 25-80 | 25-70 | |
| Steel <1200 N/mm | 0,020-0,06 | 15-50 | 15-40 | 15-40 | 15-50 | 15-55 | 15-50 | |
| Stainless Steel | 0,020-0,06 | 10-40 | 10-35 | 15-35 | 10-40 | 10-45 | 10-40 | 200-400 |
| Aluminium | 0,040-0,08 | 500-900 | 500-900 | 500-900 | 500-900 | 500-900 | 90-900 | 500-900 |
| Brass | 0,040-0,08 | | 400-600 | 400-600 | 400-600 | 400-600 | 90-600 | 400-600 |
| Copper | 0,040-0,06 | | 200-300 | 200-300 | 200-300 | 200-300 | 90-300 | 200-300 |
| Bronze | 0,040-0,07 | | 200-400 | 200-400 | 200-400 | 200-400 | 90-400 | |
| Titanium | 0,020-0,05 | | | | 15-30 | 15-45 | | |
| Inconel | 0,025-0,05 | | | | 16-45 | 20-50 | | |
| Zinc Alloy | 0,025-0,08 | 45-130 | 30-100 | 30-100 | 30-100 | 45-100 | 30-100 | |
| Cast Iron | 0,025-0,05 | 30-50 | 30-50 | 30-50 | 30-50 | 30-55 | 30-50 | |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

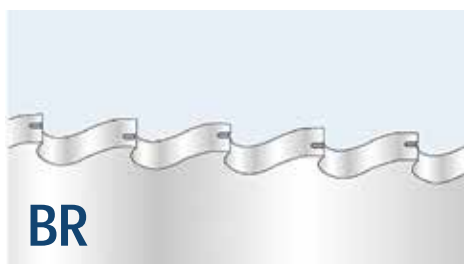
TOOTH TYPES



C tooth form is used for solid cutting and thick pipes which is over 3 mm thickness. ($S > 3\text{mm}$)



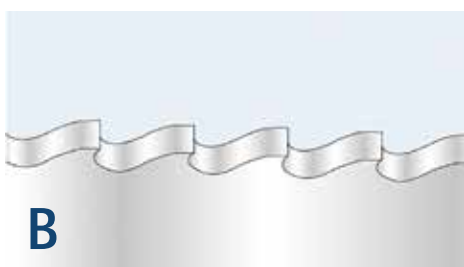
A tooth form is used for cutting materials like brass and bronze which is under 3 mm thickness.



BR tooth form is the best shape for cutting pipes on automatic machines. It allows more cutting numbers according to other forms.



BW tooth form is the standard tooth shape for tube and pipe cutting. The tooth is bevelled alternatively. This causes chip shredding.



B tooth form is suitable for thin walled tubes, and some structural steels.

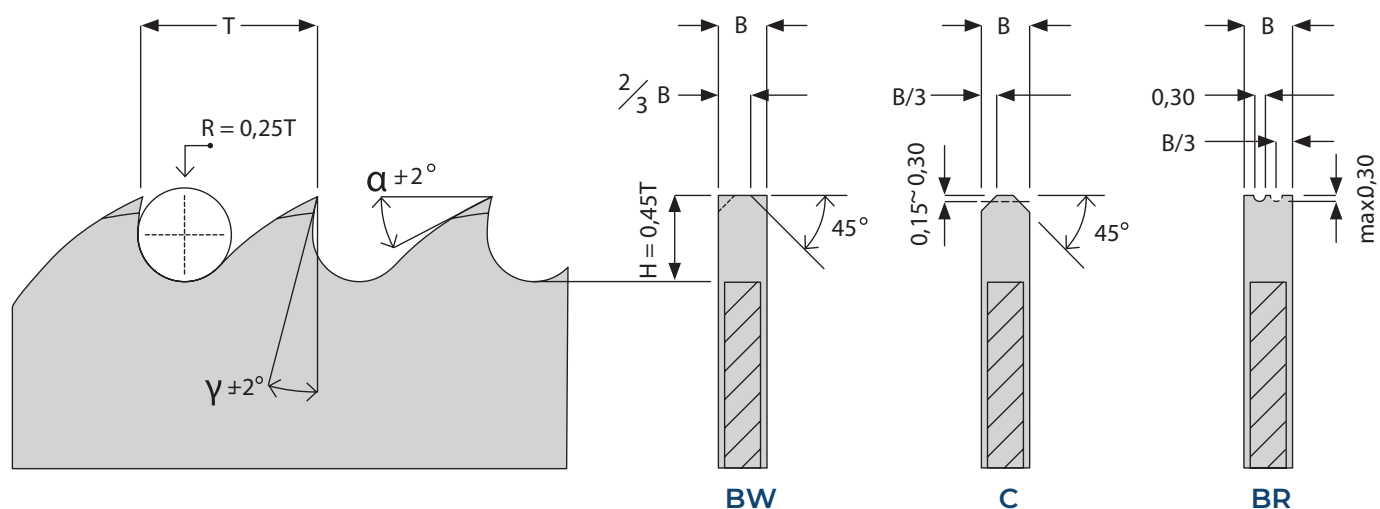


AW tooth form is similar to type A. Otherwise, it is got chip shredding.



VP tooth form is the best tooth type for irregular shaped materials which causes vibrations and loud noise.

TOOTHING & CUTTING ANGLES



B Saw Blade Thickness


R Gullet Radius

α Clearance Angle

T Tooth Pitch

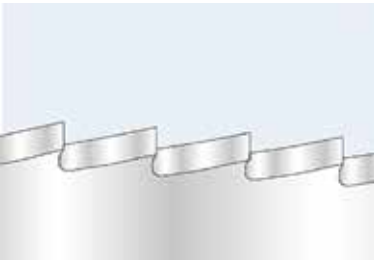
γ Cutting Angle

H Tooth Height

|  MATERIAL TYPE | Cutting Angles (Raw Material of Saw Blade) | | | |
|--|--|----------------|----------------|----------------|
| | HSS/DMo5 | | HSS/DMCo5 | |
| | γ° | α° | γ° | α° |
| Steel (<500 N/mm ²) (standard) | 18 | 12 | 18 | 12 |
| Steel (<800 N/mm ²) | 15 | 08 | 15 | 08 |
| Steel (<1200 N/mm ²) | 12 | 06 | 12 | 06 |
| Stainless Steel (standard) | 12 | 06 | 12 | 06 |
| Cast Iron | 12 | 08 | 12 | 18 |
| Brass | 15 | 15 | 15 | 15 |
| Copper | 16 | 18 | 16 | 18 |
| Bronze | 12 | 08 | 12 | 08 |
| Aluminium | 15 | 15 | 15 | 15 |
| Zinc Alloy | 12 | 08 | 12 | 08 |
| Inconel | - | - | - | - |
| Titanium | - | - | - | - |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

SAW BLADES ACCORDING TO DIN

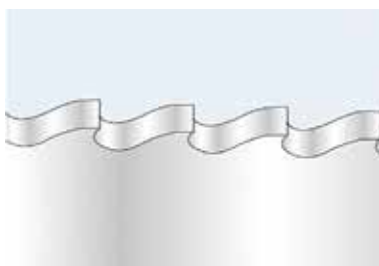
| | Metal Cutting Circular Saw Blades / According to DIN 1837 A | | | | |
|--|---|------------------|------|------|------|
| Tooth Form A DIN 1837 | Saw Blade Diameter D1 (mm) | 160 | 200 | 250 | 315 |
| | Hub Diameter D2 (mm) | 63 | 63 | 63 | 80 |
| | Bore Diameter d (mm) | 32 | 32 | 32 | 40 |
|  | Saw Blade Thickness | Tooth Number (Z) | | | |
| | 1,00 | 160A | 200A | | |
| | 1,20 | 160A | 200A | | |
| | 1,60 | 160A | 160A | 200A | |
| | 2,00 | 128A | 160A | 200A | |
| | 2,50 | 128A | 160A | 160A | 200A |
| | 3,00 | 128A | 128A | 160A | 200A |
| | 4,00 | 100A | 128A | 160A | 160A |
| | 5,00 | 100A | 128A | 128A | 160A |
| | 6,00 | 100A | 100A | 128A | 160A |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

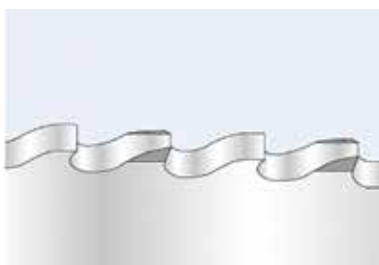


SAW BLADES ACCORDING TO DIN

The designation to "DIN standard" refers to metal cutting circular saw blades made in compliance with the German industrial standard in the 20 to 315 mm diameter range. DIN metal cutting circular saw blades are used primarily for precision sawing and milling work on universal milling machines and other precision machines.

| | Metal Cutting Circular Saw Blades / According to DIN 1838 B | | | |
|--|---|------------------|------|------|
| Tooth Form B DIN 1838 | Saw Blade Diameter D1 (mm) | 160 | 200 | 250 |
| | Hub Diameter D2 (mm) | 63 | 63 | 63 |
| | Bore Diameter d (mm) | 32 | 32 | 32 |
|  | Saw Blade Thickness | Tooth Number (Z) | | |
| | 1,00 | 80B | 100B | |
| | 1,20 | 80B | 100B | |
| | 1,60 | 80B | 80B | 100B |
| | 2,00 | 64B | 80B | 100B |
| | 2,50 | 64B | 80B | 80B |
| | 3,00 | 64B | 64B | 80B |
| | 4,00 | 48B | 64B | 80B |
| | 5,00 | 48B | 64B | 80B |
| | 6,00 | 48B | 48B | 64B |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

| | Metal Cutting Circular Saw Blades / According to DIN 1838 C | | | |
|---|---|------------------|------|------|
| Tooth Form C DIN 1838 | Saw Blade Diameter D1 (mm) | 160 | 200 | 250 |
| | Hub Diameter D2 (mm) | 63 | 63 | 63 |
| | Bore Diameter d (mm) | 32 | 32 | 32 |
|  | Saw Blade Thickness | Tooth Number (Z) | | |
| | 1,00 | 80C | 100C | |
| | 1,20 | 80C | 100C | |
| | 1,60 | 80C | 80C | 100C |
| | 2,00 | 64C | 80C | 100C |
| | 2,50 | 64C | 80C | 80C |
| | 3,00 | 64C | 64C | 80C |
| | 4,00 | 48C | 64C | 80C |
| | 5,00 | 48C | 64C | 80C |
| | 6,00 | 48C | 48C | 64C |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

STANDARD PIN HOLES FOR CUT OFF MACHINES

| Machine Brand | Saw Blade Diameter (D1) | Bore Diameter (d2) | Pin Holes |
|---------------|---|--------------------|------------------------|
| ADIGE SALA | 200-250 | 32 | 4/9/50 |
| | 275-315 | 32 | 2/11/63 |
| | 350 | 40 | 4/12/64 |
| | 400-425 | 50 | 4/15/80 |
| BEWO | 250-300 | 32 | 2/8/45 man. |
| | 315 | 40 | 2/8/55 man. |
| | 350 | 40 | 4/11/63 man. |
| | 315 | 40 | 4/11/63 aut |
| BİRLİK MAKİNE | 350-370-400-425-450 -500-550-600-620 | 50 | 4/14/84+4/15/80 |
| BIMAX | 100-300 | 32 | 2/8/45 |
| BONAK | 250-300 | 40 | 2/8/55+4/12/64 |
| BROBO | 350 | 40 | 2/8/55 |
| WALDOWN | 300 | 38 | 2/9/55 |
| | 300-400 | 40 | 2/9/55+4/12/64 |
| | 500 | 40 | 2/8/55+4/12/64+2/18/80 |
| CONNI | 400-425 | 40 | 4/11/63 |
| | 400-425 | 50 | 4/15/80 |
| DEMURGER | 160-300 | 25.4 | - |
| | 200-250 | 32 | 2/8/45+ 2/11/63 |
| | 225-300 | 40 | 2/8/55+4/12/64 |
| DONG JIN | 275-370 | 40 | 2/8/55+4/11/63 |
| DORINGER | 300-350 | 40 | 2/8/55+4/12/64 |
| EISELE | 110 | 22 | - |
| | 210-225 | 40 | 2/8/55 |
| | 250-350 | 40 | 2/8/55+4/12/64 |
| | 370-450 | 40 | 2/12/64+2/15/80 |
| | 500 | 40 | 2/15/80+2/15/100 |
| FABRIS | 225-350 | 32 | 2/8/45/+2/11/63 |
| FEMI | 225-315 | 32 | 2/8/45+2/11/63 |
| FONG-HO | 250-275 | 32 | 2/8/45+2/9/50+2/11/63 |
| | 300-400 | 32 | 4/11/63 |
| | 360 | 40 | 2/11/63+3/11/65 |
| GERNETTI | 250-350 | 40 | 4/11/63 |
| HAEBERLE | 225-315 | 40 | 2/8/55 |
| IBP | 200-350 | 32 | 2/8/45+2/11/63 |
| PEDRAZZOLI | 425 | 50 | 4/15/80 |
| IMET | 250-350 | 32 | 2/8/45+2/11/63 |
| | 315-350 | 40 | 2/8/55+4/12/64 |
| KALTENBACH | 225-250 | 32 | 2/8/45+2/9/40+2/11/63 |
| | 350-370 | 50 | 4/15/80 |
| KASTO | 425 | 50 | 4/15/80 |
| MACC | 425 | 50 | 4/15/80 |
| | 300-350 | 32 | 2/8/45+2/11/63 |

STANDARD PIN HOLES FOR CUT OFF MACHINES

| Machine Brand | Saw Blade Diameter (D1) | Bore Diameter (d2) | Pin Holes |
|---------------------------------|-------------------------|--------------------|-----------------|
| MACC | 225-350 | 32 | 2/8/45+2/11/63 |
| MAIR | 300-350 | 40 | 2/8/55+4/12/64 |
| MEP | 225-350 | 32 | 2/8/45+2/11/63 |
| MTM | 500-550 | 90 | 3/12,5/160 |
| OMES | 250-300 | 32 | 2/8/45+2/11/63 |
| OMP | 250-370 | 32 | 2/8/45+2/11/63 |
| | 400-525 | 50 | 4/15/80 |
| OTO MILLS | 500 | 50 | 4/15/80 |
| | 550 | 140 | 4/17/170 |
| R.G.A | 250 | 25.4 | - |
| | 250-370 | 40 | 2/8/55+2/12/64 |
| ROBEJO | 250-350 | 32 | 2/8/45+2/11/63 |
| ROHBI | 175-250 | 32 | 2/8/45 |
| SCOTCHMAN | 250-300 | 32 | 2/8/45+2/11/63 |
| INDUSTRIES | 275-350 | 40 | 2/8/55+4/12/64 |
| SIMEC | 200-350 | 32 | 2/8/45+ 2/11/63 |
| SINICO | 350 | 32 | 2/8/45+4/11/63 |
| SOCO | 250-350 | 32 | 2/11/63 |
| STARTRITE | 250 | 32 | 2/9/56 |
| | 300-315 | 32 | 2/11/80 |
| STAYER | 225 | 32 | - |
| THOMAS | 225-300 | 32 | 2/8/45+2/11/6 |
| | 315-350 | 32 | 2/11/63+2/12/75 |
| TOMET | 200-315 | 32 | 2/8/45+2/11/63 |
| TRENNJAEGER | 250-315 | 40 | 4/12/64+2/8/55 |
| | 315-450 | 50 | 4/14/85+4/15/80 |
| | 450-525 | 50 | 4/18/100 |
| ULMIA | 160-250 | 32 | - |
| | 250-400 | 40 | 4/11/63 |
| VIEMME | 250-350 | 32 | 2/8/45+2/11/63 |
| VOUCHER | 275 | 35 | 2/13,5/57,2 |
| YÜKSEL OTOMASYON-ERW TECH | 550 | 50 | 4/14/85+4/15/80 |
| | 350 | 40 | 4/12/64 |
| WAGNER | 200-315 | 32 | 4/9/50 |
| | 350 | 50 | 4/14/85+4/15/80 |
| WAHLEN | 250-400 | 40 | 2/8/55+4/11/63 |
| WEIDMANN | 210-275 | 32 | 2/8/45+2/11/63 |
| WINTER | 250-315 | 40 | 2/8/55+4/11/63 |
| WUNSCH | 210-250 | 32 | 2/8/45 |
| | 210-400 | 40 | 2/8/55+4/12/64 |
| PDS MACHINERY | 400-425 | 50 | 4/14/80+4/14/85 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

PROBLEMS & SOLUTIONS

| Problem | Possible Causes | Solutions |
|----------------------------------|---|-----------------------|
| Burs | Tooth pitch too large | Reduce the pitch |
| | Worn teeth | Reground the saw |
| Build-up of chip in tooth gullet | Tooth pitch too small | Increase the pitch |
| | Incorrect tooth shape | Reduce the pitch |
| | Speed too high | Reduce the pitch |
| Blade breakage | Cutting speed too high | Reduce the pitch |
| | Feed speed too high | |
| | Blade feed speed not constant | Check machine |
| | Incorrect ratio between feed and cutting speeds | Reduce the pitch |
| | Play in blade clamping system | Check clamping system |
| | Tooth pitch too small | Check flange |
| | Tooth pitch too large | Check pitch |
| | Lubrication cooling absent or inadequate | Reduce the pitch |
| Poor surface finish of cut piece | Worn teeth | Reduce the pitch |
| | Tooth pitch too large | Check pitch |
| | Incorrect shape of tooth | Reduce the pitch |
| | Incorrect cutting speed | Reduce the pitch |

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TCT

SAW BLADES



AZAK
TOOL TECHNOLOGIES



“

**Reinforce your strength with
Azak TCT Circular Saw Blades**

ST001 - FOR CUTTING SOLIDS WITH HIGH TENSILE STRENGTH

The PVD coated, carbide tipped ST001 saw blade has been developed for cutting solid carbon steel (carbon content < 0.60%) with a tensile strength 500 N/mm² and higher at very high production rates.

Main application areas and the parameters:

• Solid carbon steel with a tensile strength between 500 and 900 N/mm² on high performance machines.

Suggested cutting speed: 100 - 280 m/min.

Feed rate: 0,06 - 0,10 mm/tooth.

Machines: Soco, Nishijimax, Tsune, Mega, Everising, Rattunde, Behringer.

• Hard solid carbon steel with a tensile strength higher than 900 N/mm² and ferritic, martensitic and duplex stainless steel bars Ø > 35 mm on high performance machines

Suggested cutting speed: 60 - 140 m/min.

Feed rate: 0,05 - 0,09 mm/tooth.

Machines: Soco, Nishijimax, Tsune, Mega, Everising, Rattunde, Behringer.

Advantages:

- New saw body design
- Specifically designed for cutting solid carbon steel with medium tensile strengths
- High productivity
- Best blade life performances when a wider range of materials needs to be cut

STANDARD DIMENSIONS FOR ST001

| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
|-------------|--------------|-------------|-----------------|-----------------|
| 250 | 2 | 32 | 90/110/120 | 0,05 |
| | 2,9 | 50 | 110 | 0,05 |
| 270 | 2 | 40 | 110 | 0,07 |
| 285 | 2 | 32 | 110/140 | 0,07 |
| | 2,5 | 40 | 110 | 0,07 |
| | 3,3 | 40 | 140 | 0,07 |
| 315 | 2 | 32 | 110/140 | 0,07 |
| | 2,3 | 40 | 110/120/140 | 0,07 |
| | 2,5 | 50 | 100/120/140/150 | 0,07 |
| | 2,7 | 50 | 150 | 0,07 |
| 350 | 2,34 | 32 | 120 | 0,07 |
| | 2,7 | 40 | 120/140 | 0,07 |
| | 2,8 | 50 | 140 | 0,07 |
| 360 | 2,5 | 32 | 140 | 0,10 |
| | 2,6 | 40 | 110/140 | 0,10 |
| | 2,7 | 40 | 140 | 0,10 |
| | 2,75 | 50 | 150 | 0,10 |
| | 2,8 | 50 | 140 | 0,10 |
| | 3 | 50 | 140 | 0,10 |
| 370 | 2,2 | 32 | 120 | 0,10 |
| | 2,3 | 40 | 120 | 0,10 |
| | 2,34 | 40 | 120 | 0,10 |
| | 2,4 | 50 | 120 | 0,10 |
| | 2,6 | 50 | 140 | 0,10 |
| 375 | 2,8 | 50 | 120 | 0,10 |
| 380 | 2,5 | 40 | 130/140 | 0,10 |
| | 2,6 | 50 | 140 | 0,10 |
| | 2,8 | 50 | 115 | 0,10 |
| 400 | 2,7 | 50 | 140 | 0,10 |
| | 2,75 | 50 | 140/150 | 0,10 |
| | 2,8 | 50 | 140 | 0,10 |
| 420 | 2,6 | 40 | 140/160 | 0,10 |
| | 2,7 | 40 | 140 | 0,10 |
| | 3 | 50 | 140 | 0,10 |
| | 3,34 | 50 | 140 | 0,10 |

STANDARD DIMENSIONS FOR ST001

| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
|-------------|--------------|-------------|-----------------|-----------------|
| 425 | 2,7 | 32 | 120/140 | 0,10 |
| 450 | 3 | 50 | 140 | 0,12 |
| 460 | 2,7 | 40 | 120/140/150 | 0,12 |
| | 2,8 | 50 | 140/150 | 0,12 |
| 480 | 2,7 | 40 | 140 | 0,12 |
| | 2,8 | 50 | 140 | 0,12 |
| | 3 | 50 | 140 | 0,12 |
| 500 | 2,7 | 40 | 120/140 | 0,15 |
| | 2,75 | 40 | 150 | 0,15 |
| | 2,8 | 40 | 140 | 0,15 |
| | 3,2 | 50 | 180 | 0,15 |
| | 3,4 | 80 | 140/150/160 | 0,15 |
| | | 80 | 150 | 0,15 |
| | | 80 | 160 | 0,15 |
| 520 | 2,7 | 40 | 140 | 0,15 |
| | 3,2 | 40 | 140 | 0,15 |
| | 3,4 | 40 | 200 | 0,15 |
| | 3,6 | 50 | 140 | 0,15 |
| | 3,7 | 50 | 140 | 0,15 |
| | 3,8 | 50 | 140/150 | 0,15 |
| 525 | 3,4 | 50 | 200 | 0,15 |
| 560 | 3 | 40 | 140/150 | 0,15 |
| | 3,7 | 50 | 150/200 | 0,15 |
| | 3,8 | 80 | 140/150 | 0,15 |
| 580 | 3,2 | 80 | 170/200 | 0,15 |
| | 3,7 | 80 | 170 | 0,15 |
| 600 | 3,6 | 80 | 180 | 0,15 |
| 630 | 3,2 | 50 | 150/160/200 | 0,15 |
| | 3,8 | 80 | 200 | 0,15 |
| 650 | 3,7 | 80 | 200 | 0,15 |
| | 3,8 | 80 | 180/270 | 0,15 |
| 660 | 3,7 | 80 | 200 | 0,15 |
| 690 | 3,6 | 80 | 180 | 0,15 |
| 750 | 3,8 | 80 | 250 | 0,15 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."



ST002 - FOR FLYING CUT OFF APPLICATIONS

ST002 is a TCT saw blade for flying cut off applications. It provides an opportunity to greatly increase the tube manufacturing line speeds and cut the production costs. There are 3 versions available as for single / twin cut off units, applications with heavy inside scarf and for orbital flying cut off applications.

Main application areas and the parameters:

- Single and twin flying cut-off machines designed for TCT cutting with small or no ID-scarf. Tubes with a tensile strength up to 1.000 N/mm²
Cutting speed: 350 m/min (starting value). Tooth load: 1/2/3: relation 1/2/0.8. 0.05/0.10/0.04 mm/tooth.
- For flying cut-off applications dealing with heavy inside scarf. It features a very specific tooth geometry, combined with highly shock resistant carbide tips. Due to strong saw body shoulders which give the teeth maximum support, the combination tooth/body obtains very high stability and fracture resistance.
Cutting speed: 400 – 500 m/min (choose max available).
Tooth load: 1/2/3: relation 1/1/1. Starting value 0.04 mm/tooth.
Machines: MTM, OTO mills, Nakata and Olimpia.
- For orbital flying cut-off applications on tube mills. Key features of this saw blade are fracture-resistant carbide tips, protected with PVD coating.
Cutting speed: 350 – 400 m/min.
Feed rate: 1/2: 0,04 / 0,12 mm/tooth.
Machines: MTM, OTO mills, Elmaksan, Kusakabe, Linsinger, Nakata and SMS Meer.

Advantages:

- Extremely high line speed because of very short cutting times
- Very good surface finish, burr-free cut
- Increased uptime
- High blade life
- Cuts heavy ID scarf
- Cuts high tensile API Pipes (up to 1.800 N/mm²)
- Various tooth geometries available
- Burr-free cut

STANDARD DIMENSIONS FOR ST002

| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
|-------------|--------------|-------------|-----------------|-----------------|
| 250 | 2,3 | 32 | 180 | 0,05 |
| | 3,2 | 40 | 180 | 0,05 |
| | 3,7 | 45 | 180 | 0,05 |
| 285 | 2 | 32 | 110 | 0,07 |
| | 3,6 | 40 | 120 | 0,07 |
| 300 | 3,2 | 80 | 220 | 0,07 |
| | 3,7 | | | 0,07 |
| | 4,3 | | | 0,07 |
| 315 | 2,2 | 32 | 100 | 0,07 |
| | 2,3 | | 100 | 0,07 |
| | 2,5 | | 120 | 0,07 |
| | 3 | | 120 | 0,07 |
| | 3,2 | | 220 | 0,07 |
| | 3,5 | | 140 | 0,07 |
| | 3,6 | | 100/170 | 0,07 |
| 320 | 3,2 | 50 | 140 | 0,07 |
| | 3,7 | 50 | 140 | 0,07 |
| | | 80 | 220 | 0,07 |
| | | 115 | 230 | 0,07 |
| 350 | 2,3 | 32 | 100/120/140 | 0,07 |
| | 2,7 | 50 | 120/140/280 | 0,07 |
| | 2,8 | 50 | 140 | 0,07 |

STANDARD DIMENSIONS FOR ST002

| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
|-------------|--------------|-------------|-----------------|-----------------|
| 350 | 3,2 | 50 | 140/280 | 0,07 |
| | | 80 | | |
| | 3,6 | 32 | 140/170 | 0,07 |
| | | 40 | | |
| 355 | 3,7 | 50 | 280 | 0,07 |
| | | 115 | | |
| | 4,3 | 50 | 150 | 0,07 |
| | | 50 | | |
| | 2,8 | 45 | 280 | 0,10 |
| | | 45 | | |
| | 3,2 | 50 | 160/280 | 0,10 |
| | | 80 | | |
| 370 | 3,6 | 45 | 160 | 0,10 |
| | | 90 | | |
| | 3,7 | 45 | 280 | 0,10 |
| | | 80 | | |
| 380 | 4,3 | 80 | 280 | 0,10 |
| | | 80 | | |
| | 2,3 | 40 | 140 | 0,10 |
| | | 40 | | |
| 380 | 3,2 | 50 | 280 | 0,10 |
| | | 80 | | |
| | 3,7 | 50 | 280 320 | 0,10 |
| | | 80 | | |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

| STANDARD DIMENSIONS FOR ST002 | | | | |
|-------------------------------|--------------|----------------------|-----------------|-----------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 400 | 4,3 | 115 | 320 | 0,10 |
| | 4,8 | 50 | 250 | 0,10 |
| 400 | 2,3 | 40 50 | 120 | 0,10 |
| | 2,8 | 40 50 | 120 | 0,10 |
| | 3,2 | 50 115 | 150/280 | 0,10 |
| | 3,5 | 50 | 150 | 0,10 |
| | 3,6 | 40 50 | 120/140/170 | 0,10 |
| | 3,7 | 50 | 250 | 0,10 |
| 420 | 4,3 | 115 | 250 | 0,10 |
| 425 | 2,8 | 40 | 140 | 0,10 |
| | 3,7 | 80 | 230 | 0,10 |
| 450 | 2,5 | 50 | 150 | 0,12 |
| | 2,8 | 50 80 | 120/140/160 | 0,12 |
| | | | 140 | 0,12 |
| | | | 150 | 0,12 |
| | | | 160 | 0,12 |
| | 3 | 50 | 140/150/250 | 0,12 |
| | 3,2 | 50 | 150 | 0,12 |
| 460 | 2,8 | 50 | 120 | 0,12 |
| | 3,2 | | 280 | 0,12 |
| 500 | 2,8 | 50 140 | 120/140/220 | 0,15 |
| | 3,4 | 40 50 80 90 | 120/160/220 | 0,15 |
| | | | | |
| | | | | |
| | 3,5 | 50 | 140 | 0,15 |

| STANDARD DIMENSIONS FOR ST002 | | | | |
|-------------------------------|--------------|-----------------------|-----------------|-----------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 500 | 3,6 | 40 50 80 90 | 160/170/220 | 0,15 |
| | 4 | 50 | 120 | 0,15 |
| 520 | 3,6 | 50 80 | 140/180 | 0,15 |
| 550 | 4 | 140 | 230 | 0,15 |
| 560 | 2,8 | 140 | 225 | 0,15 |
| | 3,6 | 50 80 90 140 | 150/220/230 | 0,15 |
| | | | | |
| | | | | |
| | 4 | 50 140 | 230 | 0,15 |
| 560 | 4,8 | 50 140 | 220 | 0,15 |
| 580 | 5,5 | 80 | 160 | 0,15 |
| 600 | 3,6 | 50 80 90 140 | 140/240/320 | 0,15 |
| | 3,8 | 140 | 225 | 0,15 |
| | 4,8 | 140 | 220 | 0,15 |
| 620 | 3,6 | 140 | 225 | 0,15 |
| | 4 | 140 | 230 | 0,15 |
| 630 | 3,6 | 80 | 160/200 | 0,15 |
| 650 | 3,6 | 80 120 | 320 | 0,15 |
| 660 | 3,6 | 80 | 180 | 0,15 |
| 690 | 3,6 | 80 | 180/220 | 0,15 |
| | 3,7 | 50 | 200 | 0,15 |
| 760 | 4,4 | 80 | 220 | 0,15 |

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CHOOSING THE RIGHT NUMBER OF TOOTH

| Blade Diameter [mm] | Tooth Thickness [mm] | Body Thickness [mm] | Bore Diameter [mm] | Number of Tooth (Z) | Pipe Diameter [mm] | Pipe Thickness [mm] |
|------------------------|-------------------------|------------------------|-----------------------|---------------------------|-----------------------|------------------------|
| 250 | 2,00 | 1,70 | 32 | 60 | 60 | 5,0 - 10,0 |
| | 2,00 | 1,70 | 32 | 72 | 60 | 4,0 - 8,5 |
| | 2,00 | 1,70 | 32 | 80 | 60 | 4,0 - 7,5 |
| | 2,00 | 1,70 | 32 | 100 | 60 | 3,0 - 6,0 |
| 285 | 2,00 | 1,70 / 1,75 | 32 / 40 | 80 | 75 | 4,0 - 7,5 |
| | 2,00 | 1,70 / 1,75 | 32 / 40 | 100 | 75 | 3,0 - 6,0 |
| | 2,00 | 1,70 / 1,75 | 32 / 40 | 120 | 75 | 2,5 - 5,0 |
| | 2,00 | 1,70 / 1,75 | 32 / 40 | 140 | 75 | 2,0 - 4,0 |
| 315 | 2,20 | 1,90 | 32 / 40 | 80 | 90 | 4,0 - 7,5 |
| | 2,20 | 1,90 | 32 / 40 | 100 | 90 | 3,0 - 6,0 |
| | 2,20 | 1,90 | 32 / 40 | 120 | 90 | 2,5 - 5,0 |
| | 2,20 | 1,90 | 32 / 40 | 140 | 90 | 2,0 - 4,0 |
| 350 | 2,60 | 2,27 | 50 | 80 | 100 | 4,0 - 8,0 |
| | 2,60 | 2,27 | 50 | 100 | 100 | 3,0 - 6,5 |
| | 2,60 | 2,27 | 50 | 120 | 100 | 2,5 - 5,5 |
| | 2,60 | 2,27 | 50 | 140 | 100 | 2,2 - 4,5 |
| 360 | 2,60 | 2,27 | 32 / 40 / 50 | 80 | 110 | 4,5 - 9,0 |
| | 2,60 | 2,27 | 32 / 40 / 50 | 100 | 110 | 3,5 - 7,0 |
| | 2,60 | 2,27 | 32 / 40 / 50 | 120 | 110 | 3,0 - 6,0 |
| | 2,60 | 2,27 | 32/40/50 | 140 | 110 | 2,2 - 4,5 |
| 370 | 2,30 | 2,00 | 32 / 50 | 80 | 110 | 4,5 - 9,0 |
| | 2,30 | 2,00 | 32 / 50 | 100 | 110 | 3,5 - 7,0 |
| | 2,30 | 2,00 | 32 / 50 | 120 | 110 | 3,0 - 6,0 |
| | 2,30 | 2,00 | 32 / 50 | 140 | 110 | 2,2 - 4,5 |
| 400 | 3,00 | 2,50 | 50 | 100 | 115 | 3,5 - 7,0 |
| | 3,00 | 2,50 | 50 | 120 | 115 | 3,0 - 6,0 |
| | 3,00 | 2,50 | 50 | 140 | 115 | 2,5 - 5,0 |
| 425 | 2,60 | 2,27 | 50 | 100 | 130 | 4,5 - 9,0 |
| | 2,60 | 2,27 | 50 | 120 | 130 | 4,0 - 7,5 |
| | 2,60 | 2,27 | 50 | 140 | 130 | 3,0 - 6,0 |
| 450 | 2,90 | 2,50 | 50 | 90 | 145 | 5,0 - 10,5 |
| | 2,90 | 2,50 | 50 | 100 | 145 | 5,0 - 9,5 |
| | 2,90 | 2,50 | 50 | 120 | 145 | 4,0 - 8,0 |
| | 2,90 | 2,50 | 50 | 130 | 145 | 3,5 - 7,5 |
| | 2,90 | 2,50 | 50 | 140 | 145 | 3,0 - 7,0 |
| | 2,90 | 2,50 | 50 | 160 | 145 | 2,5 - 6,0 |
| 500 | 3,50 | 3,00 | 50 | 120 | 170 | 4,5 - 9,0 |
| | 3,50 | 3,00 | 50 | 140 | 170 | 4,0 - 8,0 |
| | 3,50 | 3,00 | 50 | 170 | 170 | 3,0 - 6,0 |
| 550 | 3,80 | 3,20 | 90 / 140 | 120 | 175 | 5,0 - 9,5 |
| | 3,80 | 3,20 | 90 / 140 | 140 | 175 | 4,0 - 8,0 |
| | 3,80 | 3,20 | 90 / 140 | 170 | 175 | 3,5 - 6,5 |
| | 3,80 | 3,20 | 90 / 140 | 180 | 175 | 3,0 - 6,0 |
| 560 | 3,80 | 3,20 | 80/90/140 | 120 | 180 | 5,0 - 9,5 |
| | 3,80 | 3,20 | 80 / 90 / 140 | 140 | 180 | 4,0 - 8,0 |
| | 3,80 | 3,20 | 80/90/140 | 170 | 180 | 3,5 - 6,5 |
| 600 | 3,80 | 3,20 | 90 / 140 | 120 | 200 | 5,0 - 11,0 |
| | 3,80 | 3,20 | 90 / 140 | 140 | 200 | 4,5 - 9,5 |
| | 3,80 | 3,20 | 90 / 140 | 170 | 200 | 4,0 - 8,0 |
| | 3,80 | 3,20 | 90 / 140 | 180 | 200 | 3,5 - 7,5 |
| 650 | 3,80 | 3,20 | 80 | 150 | 225 | 5,0 - 12,0 |
| | 3,80 | 3,20 | 80 | 170 | 225 | 4,5 - 9,5 |
| 690 | 3,80 | 3,20 | 80 | 150 | 245 | 5,5 - 13,0 |
| | 3,80 | 3,20 | 80 | 170 | 245 | 5,0 - 11,0 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

AZAK FLYCUT TCT PIPE CUTTING PARAMETERS

|  | < 4,0 mm | |
|---|-------------|--------------|
| | V [m/1'] | Az [mm/Z] |
| MATERIALS (TENSILE STRENGTH) | | |
| Mild steel < 500 [N/mm ²] | 95- 240 | 0,03 - 0,15 |
| Carbon steel 500 - 750 [N/mm ²] | 65- 160 | 0,03 - 0,10 |
| Alloyed steel 750 - 950 [N/mm ²] | 40- 110 | 0,025 -0,08 |
| High tension steel 950 - 1200[N/mm ²] | 15- 110 | 0,025 - 0,07 |
| Tool steel > 950 [N/mm ²] | | |
| Austenitic Stainless steel 500 -800[N/mm ²] | 20- 45 | 0,015 -0,04 |
| Ferritic Stainless steel 400 - 700 [N/mm ²] | 30- 90 | 0,02 - 0,06 |



ST003 - FOR CUTTING TUBES AT HIGH PERFORMANCE AUTOMATIC MACHINES

ST003 saw blade has been developed for cutting tubes on high performance automatic sawing machines. It is most effective on sawing machines with accurate control of chip load and variable feed rate. Bigger tips are applied at pitches > 9mm for added stability.

Main application areas and parameters:

• Steel tubes with a tensile strength between 600 to 1,500 N/mm².

Suggested cutting speed: 180 - 280 m/min.

Feed rate: 0,04 - 0,16 mm/tooth.

Machines: Soco, Rattunde, Sinico, Bewo, RSA, Plantool, Adige, OMP

• Thin walled steel tubes with a tensile strength up to 1,800 N/mm² Suggested cutting speed: 200 - 350 m/min.

Feed rate: 0,04 - 0,2 mm/tooth

Machines: Soco, Rattunde, Sinico, Bewo, RSA, Adige

Advantages

- For high performance cutting of carbon steel tubes
- Cutting alloyed steel up to 900 N/mm²
- Versatile, fast, cost-effective, dependable performance
- Cutting tubes with tensile strengths up to 1,800 N/mm²
- Cutting speeds up to 350 m/min
- Very high feed rates

| STANDARD DIMENSIONS FOR ST003 | | | | |
|-------------------------------|-----------------|----------------|--------------------|--------------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 240 | 1,75 | 32 | 80 | 0,05 |
| 250 | 1,7 | 32 | 110 | 0,05 |
| | 2 | 40 | 110/120 | 0,05 |
| | 2,3 | 40 | 110 | 0,05 |
| 285 | 1,6 | 32 | 110 | 0,07 |
| | 2 | 40 | 110/140 | 0,07 |
| | 2,5 | 40 | 200 | 0,07 |
| 315 | 2,2 | 32 40 | 100/120 | 0,07 |
| | 2,3 | 32 40 | 110/140 | 0,07 |
| | 2,5 | 32 40 50 | 110/140 | 0,07 |
| 350 | 2,2 | 32 40 | 120/140 | 0,07 |
| | 2,3 | 40 50 | 110/140 | 0,07 |
| | 2,4 | 32 50 | 140 | 0,07 |
| | 2,6 | 32 40 50 | 110/140/200 | 0,07 |
| | 2,7 | 32 40 50 | 120/140 | 0,07 |
| | 2,7 | 40 50 | 120/140 | 0,07 |
| 360 | 2,5 | 32 | 110/140/180 | 0,10 |
| | 2,6 | 40 | 110/140/180 | 0,10 |
| | 2,7 | 50 | 140 | 0,10 |
| 370 | 2,2 | 40 | 120 | 0,10 |

| STANDARD DIMENSIONS FOR ST003 | | | | |
|-------------------------------|-----------------|----------------|--------------------|--------------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 370 | 2,6 | 32 | 100/110/120 | 0,10 |
| | 2,7 | 50 | 120/140 | 0,10 |
| 375 | 2,8 | 50 | 120 | 0,10 |
| 380 | 2,8 | 50 | 120 | 0,10 |
| 400 | 2,3 | 50 | 140 | 0,10 |
| | 2,7 | 50 | 120 | 0,10 |
| | 2,8 | 50 | 120 | 0,10 |
| 420 | 3,2 | 50 | 150 | 0,10 |
| | 2,7 | 40 50 | 140 | 0,10 |
| 425 | 2,7 | 32 40 50 | 140/265 | 0,10 |
| 450 | 2,8 | 50 | 120 | 0,12 |
| | 3,6 | 50 | 140 | 0,12 |
| 460 | 2,7 | 40 50 | 130/140/160 | 0,12 |
| 480 | 2,7 | 40 | 140 | 0,12 |
| 490 | 2,7 | 40 | 140 | 0,12 |
| 500 | 3,4 | 50 | 140 | 0,15 |
| 520 | 2,7 | 40 50 | 140 | 0,15 |
| 560 | 3,4 | 50 | 200 | 0,15 |
| | 3,7 | 80 | 150/200 | 0,15 |
| 580 | 3,2 | 80 | 160 | 0,15 |
| 600 | 3,6 | 140 | 225 | 0,15 |
| 630 | 3,6 | 50 80 | 160/280 | 0,15 |
| 650 | 3,6 | 80 | 200 | 0,15 |
| 690 | 3,6 | 80 | | |
| 740 | 3,7 | 80 | | |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

ST004 - FOR CUTTING OF THIN WALLED TUBES

ST004 saw blade has been specifically designed to cut thin walled tubes. Because of its light cutting properties, it is also very well suited for use on a wide range of automatic cut-off machines.

Main application areas and parameters:

Thin wall high hardness tube cutting on lighter machines. High performance cutting of thin walled tubes and unstable profiles on highend machines. Suggested cutting speed: 160 - 280 m/min.

Feed rate: 0,025 - 0,12 mm/tooth.

Machines: Soco, Kasto, Bewo, RSA, Adige, Sinico, Rattunde

Advantages:

- For high performance cutting of carbon steel tubes
- Cutting alloyed steel up to 900 N/mm²
- Versatile, fast, cost-effective, dependable performance
- Setting new standards for fast cutting of stainless steel tubes
- Smooth cut surface, very little burr, long blade life
- Low cutting force allows cutting thin walled tube/profile
- For cutting thin wall, high hardness, unstable products
- Low vibration, low noise, smooth cut surface, low burr
- For thin walled tube/profile made of DP, CP, HSLA and TRIP type materials

STANDARD DIMENSIONS FOR ST004

| STANDARD DIMENSIONS FOR ST004 | | | | |
|-------------------------------|-----------------|----------------|--------------------|--------------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 200 | 2 | 40 | 100 | 0,05 |
| 250 | 2 | 32 | 80 | 0,05 |
| | 2,1 | 32 | 110 | 0,05 |
| 275 | 2 | 32 | 110 | 0,07 |
| 285 | 2 | 31,75 | 100/110/120 | 0,07 |
| | | 32 | | |
| | | 40 | | |
| | 2,3 | 50 | 140 | 0,07 |
| 300 | 2,2 | 32 | 100 | 0,07 |
| | 2,3 | 32 | 100 | 0,07 |
| 40 | | | | |
| 315 | 2,2 | 50 | 140 | 0,07 |
| | 2,3 | 32 | 110/120/140 | 0,07 |
| | | 40 | | |
| | | 50 | | |
| | 2,4 | 50 | 140 | 0,07 |
| 2,7 | 50 | 140 | 0,07 | |
| 350 | 2,2 | 32 | 100/120/140 | 0,07 |
| | | 40 | | |
| | | 50 | | |
| | 2,3 | 32 | 110/140 | 0,07 |
| | | 40 | | |
| | 50 | | | |
| | 2,6 | 50 | 140 | 0,07 |
| | 2,7 | 32 | 120/140 | 0,07 |
| | | 40 | | |
| | | 50 | | |
| 360 | 2,2 | 32 | 100/120/140 | 0,10 |
| | | 40 | | |

STANDARD DIMENSIONS FOR ST004

| STANDARD DIMENSIONS FOR ST004 | | | | |
|-------------------------------|-----------------|----------------|--------------------|--------------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 360 | 2,3 | 50 | 140 | 0,10 |
| | | 32 | | |
| | | 40 | 120/140 | |
| | | 50 | | |
| 370 | 2,7 | 32 | 140 | 0,10 |
| | | 40 | | |
| 380 | 2,3 | 50 | 140 | 0,10 |
| | 2,6 | 40 | 140 | 0,10 |
| 400 | 2,3 | 32 | 110/140 | 0,10 |
| | | 40 | | |
| | | 50 | | |
| | 2,6 | 50 | 140 | 0,10 |
| | 2,7 | 40 50 | 110/140 | 0,10 |
| 420 | 2,6 | 50 | 140 | 0,10 |
| | 2,7 | 50 | 140 | 0,10 |
| 425 | 2,5 | 32 50 | 140 | 0,10 |
| 450 | 2,8 | 50 | 140 | 0,10 |
| | 3,6 | 50 | 140 | 0,10 |
| 460 | 2,7 | 40 50 | 140 | 0,12 |
| 490 | 2,7 | 40 | 140 | 0,12 |
| 500 | 2,7 | 50 80 | 140/160 | 0,15 |
| | | 3,2 | 50 | 150 |
| | 3,4 | 40 50 | 120/140 | 0,15 |
| 520 | 3,6 | 50 | 150 | 0,15 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

ST005 - FOR CUTTING SOLIDS WITH LOW TENSILE STRENGTH

ST005 saw blade achieves extended blade life at solid cutting by combining the performance advantages of Cermet with the latest PVD coating technology.

Cermet tipped, PVD coated saw blade dedicated to cutting carbon steel (carbon content < 0.60%) with a low to medium tensile strength up to 750 N/mm². The best blade performance is being achieved when cutting lower tensile materials. On many applications, a blade life of 50 m² and more can be achieved.

Main application areas and parameters:

• Solid carbon steel with a tensile strength up to 750 N/mm²

Suggested cutting speed: 100 - 280 m/min.

Feed rate: 0,06 - 0,10 mm/tooth.

Machines: Soco, Kasto, Nishijima, Tsune, Amada, Behringer, RSA, Rattunde, Sinico, Mega, Exactcut, Everising

• High performance cutting of low and medium strength solid steel bars with a tensile strength of 400 - 800 N/mm² with high requirements on surface quality and straightness

Suggested cutting speed: 100 - 280 m/min.

Feed rate: 0,04 - 0,11 mm/tooth.

Machines: Soco, Rattunde, Kasto, Nishijima, Tsune, Behringer, Mega, Exactcut, Everising and other automatic sawing machines

Advantages:

- High blade life
- Smooth surface
- Low noise
- Low cost per cut
- New saw body design
- Specifically designed for cutting low to medium tensile carbon steel

STANDARD DIMENSIONS FOR ST005

| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
|----------------|-----------------|----------------|--------------------|--------------------|
| 250 | 1,5 | 32 | 110 | 0,05 |
| | 2 | 32 | 110/120 | 0,05 |
| | | 40 | | |
| | 2,1 | 32 | 110 | 0,05 |
| 270 | 2 | 40 | 110 | 0,07 |
| 280 | 2 | 32 | 110 | 0,07 |
| 285 | 2 | 32 | 80/110 | 0,07 |
| | | 40 | | |
| | | 50 | | |
| | 2,1 | 32 | 110 | 0,07 |
| | | 40 | | |
| 315 | 2 | 32 | 110 | 0,07 |
| | 2,2 | 32 | 110/120 | 0,07 |
| | | 40 | | |
| | 2,3 | 32 | 110/120 | 0,07 |
| | | 40 | | |
| | | 32 | 140 | 0,07 |
| | 2,5 | 32 | 120/140 | 0,07 |
| | | 40 | | |
| | 2,6 | 32 | 120 | 0,07 |
| 350 | 2,4 | 50 | 140 | 0,07 |
| | 2,5 | 40 | 140 | 0,07 |
| | 2,7 | 32 | 100/140 | 0,07 |
| | | 50 | | |
| 360 | 2,5 | 32 | 120/140 | 0,10 |
| | | 40 | | |
| | | 50 | | |
| | 2,6 | 32 | 120/140 | 0,10 |
| | | 40 | | |
| | | 50 | | |

STANDARD DIMENSIONS FOR ST005

| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
|----------------|-----------------|----------------|--------------------|--------------------|
| 370 | 2 | 50 | 140 | 0,10 |
| | 2,3 | 40 | 140 | 0,10 |
| 370 | 2,5 | 50 | 140 | 0,10 |
| | 2,6 | 50 | 140 | 0,10 |
| 380 | 2,6 | 40 | 140 | 0,10 |
| | | 50 | | |
| 420 | 2,6 | 32 | 140 | 0,10 |
| | | 40 | | |
| | | 50 | | |
| | 2,7 | 40 | 140 | 0,10 |
| | | 50 | | |
| 425 | 2,7 | 40 | 130/140 | 0,10 |
| | | 50 | | |
| 460 | 2,7 | 40 | 120/140/160 | 0,12 |
| | | 50 | | |
| | | 80 | | |
| | 2,8 | 40 | 140 | 0,12 |
| 480 | 2,7 | 40 | 140 | 0,12 |
| | | 50 | | |
| | 2,8 | 50 | 140 | 0,12 |
| 500 | 2,7 | 50 | 160 | 0,15 |
| | 3,4 | 50 | 140 | 0,15 |
| 520 | 3,2 | 50 | 140 | 0,15 |
| | 3,8 | 40 | 140 | 0,15 |
| 560 | 3 | 50 | 150 | 0,15 |
| 580 | 3,2 | 80 | 170 | 0,15 |
| 630 | 3,2 | 80 | 200 | 0,15 |
| 660 | 3,2 | 80 | 200 | 0,15 |
| 750 | 3,8 | 80 | 250 | 0,15 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

SS001 - FOR CUTTING STAINLESS STEEL TUBES

The high nickel content of austenitic stainless steel tubes makes them difficult to cut with HSS saw blades. With the dedicated tooth geometry of the carbide tipped and PVD coated SS001 saw blade, perfect surface finish and burr-free tube ends will be achieved.

Main application areas and parameters:

• Austenitic stainless steel tubes
Suggested cutting speed: 80 - 140 m/min.
Feed rate: 0,06 - 0,12 mm/tooth.
Machines: Soco, Rattunde, Bewo, RSA, Sinico

Advantages:

- For high performance cutting of carbon steel tubes
- Cutting alloyed steel up to 900 N/mm²
- Versatile, fast, cost-effective, dependable performance
- Setting new standards for fast cutting of stainless steel tubes
- Smooth cut surface, very little burr, long blade life
- Low cutting force allows cutting thin walled tube/profile

| STANDARD DIMENSIONS FOR SS001 | | | | |
|-------------------------------|--------------|-------------|-----------------|-----------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 225 | 2,3 | 32 | 80/110 | 0,05 |
| 250 | 2,1 | 40 | 110 | 0,05 |
| 270 | 2 | 40 | 110 | 0,07 |
| 285 | 2 | 32 40 | 110 | 0,07 |
| 315 | 2,2 | 50 | 140 | 0,07 |
| | 2,3 | 32 40 | 110 | 0,07 |
| 350 | 2,2 | 32 | 120 | 0,07 |
| | 2,3 | 40 | 110/140 | 0,07 |
| | 2,7 | 50 | 140 | 0,07 |
| | 2,8 | 50 | 140 | 0,07 |

| STANDARD DIMENSIONS FOR SS001 | | | | |
|-------------------------------|--------------|-------------|-----------------|-----------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 355 | 2,8 | 45 50 | 280 | 0,10 |
| 360 | 2,6 | 50 | 180 | 0,10 |
| 370 | 2,6 | 32 | 120 | 0,10 |
| 400 | 2,6 | 50 | 140 | 0,10 |
| | 2,7 | 32 | 120 | 0,10 |
| 420 | 2,7 | 50 | 110 | 0,10 |
| 450 | 2,8 | 32 | 120 | 0,10 |
| | 3 | 50 | 320 | 0,10 |
| 460 | 2,6 | 40 | 150 | 0,12 |
| 560 | 3,6 | 140 | 225 | 0,15 |
| 630 | 3,6 | 80 | 200 | 0,15 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."



SS002 - FOR CUTTING STAINLESS STEEL SOLIDS

SS002 saw blades are carbide tipped and PVD coated for cutting stainless steel solids.

Main application areas and parameters:

• Austenitic, ferritic, martensitic and duplex stainless steel bars with a diameter ≤ 35 mm

Suggested cutting speed: 80 - 140 m/min.

Feed rate: 0,03 - 0,05 mm/tooth.

Machines: Soco, Tsune, Amada, Mega, Kasto, Kentai, Behringer, Exactcut, Everising

• Austenitic stainless steel bars with a diameter > 35 mm

Suggested cutting speed: 80 - 120 m/min.

Feed rate: 0,06 - 0,12 mm/tooth.

Machines: Soco, Tsune, Amada, Mega, Kasto, Kentai, Behringer, Exactcut, Everising

Advantages:

- New saw body design
- Best saw blade when cutting ferritic, martensitic and duplex stainless steel at smaller diameter ranges
- Specifically developed for stainless steel solids with a diameter ≤ 35 mm
- Dedicated tooth geometry
- Specifically developed for stainless steel bars with a diameter > 35 mm
- Very high production rates

| STANDARD DIMENSIONS FOR SS002 | | | | |
|-------------------------------|--------------|-------------|-----------------|-----------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 225 | 2 | 40 | 120 | 0,05 |
| 250 | 1,7 | 40 | 120 | 0,05 |
| | 2 | 32 40 | 110/120 | 0,05 |
| 285 | 2 | 32 40 | 100/110 | 0,07 |
| 300 | 2 | 40 | 120 | 0,07 |
| 315 | 2,6 | 32 | 110/120 | 0,07 |
| | | 40 | | |
| | | 32 | 120 | 0,07 |
| 360 | 2,5 | 40 | 140 | 0,10 |

| STANDARD DIMENSIONS FOR SS002 | | | | |
|-------------------------------|--------------|-------------|-----------------|-----------------|
| Diameter mm | Thickness mm | Borehole mm | Hub Diameter mm | Side run-out mm |
| 360 | 2,6 | 50 | 140 | 0,10 |
| 370 | 2,3 | 32 | 140 | 0,10 |
| 380 | 2,6 | 40 | 140 | 0,10 |
| 420 | 2,7 | 50 | 110/140 | 0,10 |
| 425 | 2,7 | 50 | 140 | 0,10 |
| 460 | 2,7 | 50 | 120/140/220 | 0,12 |
| | 2,8 | 50 | 140 | 0,12 |
| | 3 | 50 | 130 | 0,12 |
| 520 | 3,8 | 50 | 140 | 0,15 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."





CRV

SAW BLADES

“

Clean, reliable and efficient cuts with Azak CrV
(friction) Blades

CRV (FRICTION) SAW BLADES

AZAK Friction Saw Blades are available in Chrome Vanadium Steel to 1.2235

The tooth styles by the machine type and specification and hardness condition of the material to be sawn (blade life can be further increased by applying sawn (blade life can be further increased by applying a chrome coating).

Our standard range covers diameters of 200 mm to 1200 mm. Larger diameters are available to special order.

The ideal periperal speed range is 100*140m/sec.

Feed rates can vary from 80-2000mm/min dependant on sawing conditions

The friction saw blades are used to cut billets, slabs and grates. They are called friction blades because the cut is done with the help of the friction between the teeth of the blade and the working material

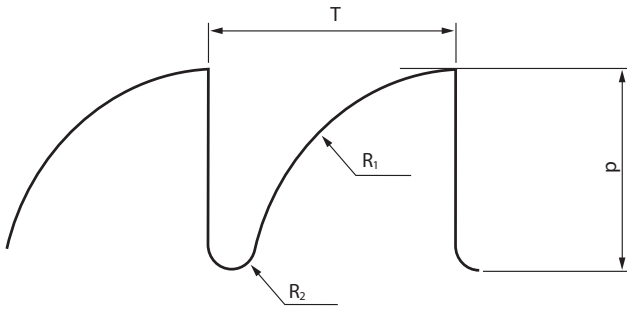
| D (mm) | Thickness (B) (mm) | Bore (d) (mm) | Number of tooth (z) |
|-----------|--------------------------|---------------------|------------------------|
| 300 | 2,5 | 40 [30] | 200 |
| | 3,0 | | |
| 350 | 2,5 | 40 [30] | 200/220 |
| | 3,0 | | 160/200/220 |
| 400 | 2,5 | 40 | 240/300 |
| | 3,0 | | |
| | 4,0 | | |
| 450 | 3,0 | 40 | 300 |
| | 3,5 | | |
| | 4,0 | | |
| 500 | 3,0 | 40 | 300 |
| | 4,0 | | |
| | 5,0 | | |
| | 6,0 | | |
| 520 | 3,0 | 40 | 300 |
| | 4,0 | | |
| | 5,0 | | |
| | 6,0 | | |
| 550 | 3,0 | 40 | 300 |
| | 4,0 | | |
| | 5,0 | | |
| 560 | 3,0 | 40 | 300 |
| | 4,0 | | |
| | 5,0 | | |
| 580 | 4,0 | 40 | 300 |
| | 5,0 | | |
| | 6,0 | | |

| D (mm) | Thickness (B) (mm) | Bore (d) (mm) | Number of tooth (z) |
|-----------|--------------------------|---------------------|------------------------|
| 600 | 4,0 | 40/50 | 300 |
| | 5,0 | | |
| | 6,0 | | |
| 650 | 4,0 | 40/50 | 300 |
| | 5,0 | | |
| | 6,0 | | |
| 700 | 4,0 | 40/50 | 300 |
| | 5,0 | | |
| | 6,0 | | |
| | 7,0 | | |
| 750 | 5,0 | 40/50 | 300/350/400 |
| | 6,0 | | |
| | 7,0 | | |
| 800 | 5,0 | 40/50 | 300/350/400 |
| | 6,0 | | |
| | 7,0 | | |
| | 8,0 | | |
| 850 | 6,0 | 40/50 | 300/350/400 |
| | 7,0 | | |
| | 8,0 | | |
| 900 | 6,0 | 50/80/100 | 300/350/400 |
| | 7,0 | | |
| | 8,0 | | |
| 1000 | 7,0 | 40/50/80/100 | 300/350/400 |
| | 8,0 | | |
| | 10,0 | | |
| 1200 | 8,0 | 40/50/80/100 | 320/350/420 |

The information given in the table is standard values. We ask you contact us regarding to your special requests.



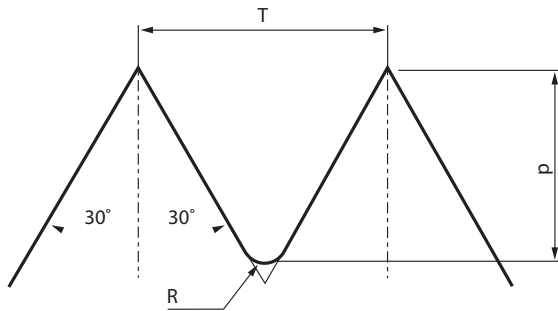
TOOTH TYPES



Parrot

Tooth shape for carbon steel friction cutting
with material cutting temperature

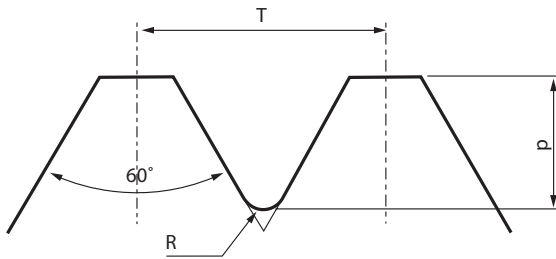
$T < 250^{\circ}\text{C}$



Triangular

Tooth shape suitable for hot cutting on
rolling billets, pipes and structural steel with
temperature

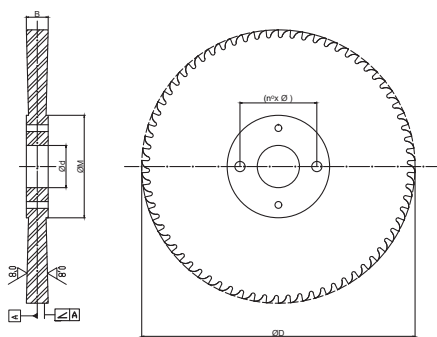
$T < 800^{\circ}\text{C}$



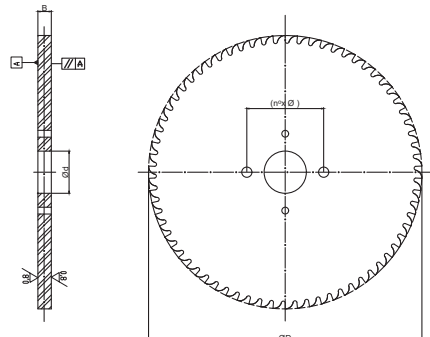
TF Triangular forged

to cut solid steel in cold and hot conditions

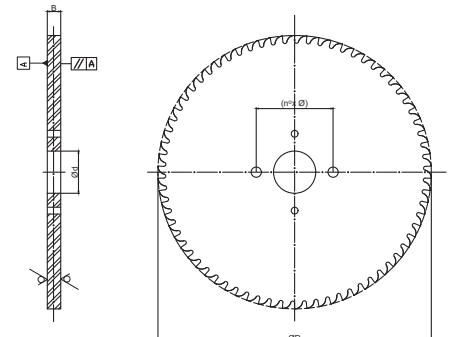
VERSIONS



Type 1



Type 2



Type 3



AZAK
TOOL TECHNOLOGIES



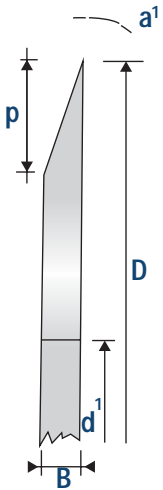
Smooth, quiet and

efficient cut with

AZAK CIRCULAR KNIVES

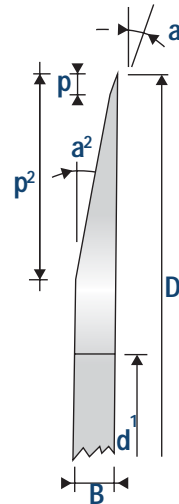
CIRCULAR KNIVES TYPES AND THE MAIN APPLICATION AREAS

Our circular knives are mainly used for the cutting of plastic, tissue, corrugated paper, cardboard, aluminium foil, rubber, textiles, carpets, glass, floor coverings and the leather. Besides, they are also used in the food industry (eg; fish and meat cutting). They can be supplied with different types of steel: 1.2379, HSS-DM05, HSSE-Co5%. They are applied on semi-automatic and automatic machines. The diameter range goes from 160 mm up to 1200 mm. The standard is without coating but on request PVD coatings (TIN, TiCN grey, TiCN red, TiAlN) are also available for the different applications. Our circular knives are manufactured upon specific working needs of our customers. Below, we can summarize the main application areas with respect to knife specifications;



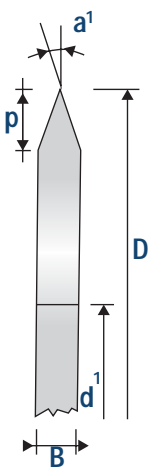
SINGLE BEVEL

Packaging material, foam, leather, frozen foods



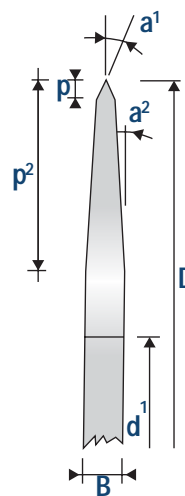
SINGLE BEVEL DOUBLE CHANFER

Aluminium, foil, adhesive tools, tissue, bandages



DOUBLE BEVEL

Plastic tubes and sections, hoses with or without metallic braid, cardboard tubes.



DOUBLE BEVEL DOUBLE CHANFER

Cardboard tubes, toilet paper, rubber section, fabrics, propylene film.

LOG SAWS

Our Log Saw Quality

The Azak Tool is well known for its high quality log saw blades. We are currently able to produce log saw blades with diameters up to 1200 mm.



In addition to the standard sizes we can manufacture any blade according your requirements, with diameters up to 1200 mm and thickness up to 10 mm. In order to optimize your production processes further we recommend our special surface coatings. Friction coefficient and temperature values are being reduced through this surface refinement and durability is being improved.

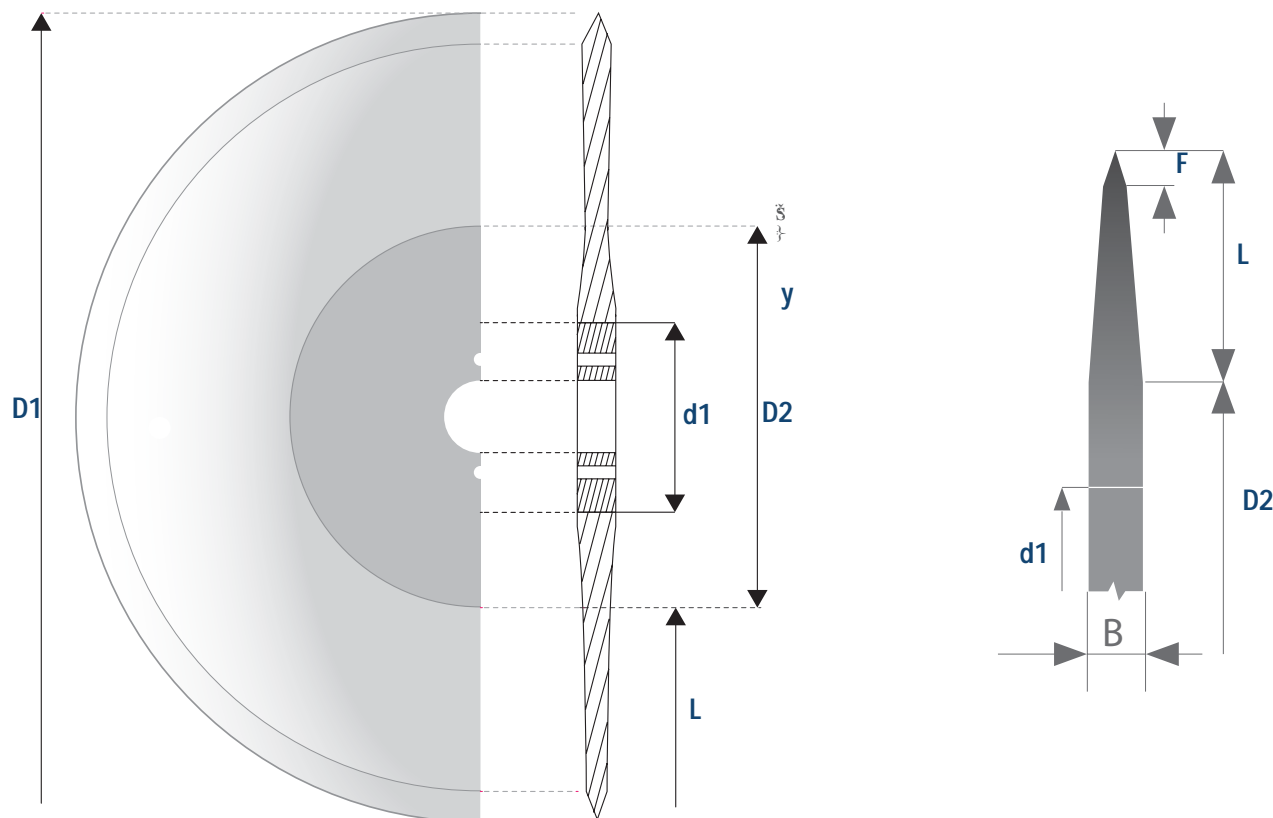


Because of unsuitable transportation or faulty handling the following quality aspects of log saw blades could be impaired:

- Lateral run-out
- Tension
- Damages to the pre-bevel
- Blade is eccentric or octagonally shaped

These quality aspects cannot be repaired by the user. Such a blade may no longer be used. If at all possible, a repair can only be performed by the blade manufacturer.

LOG SAWS



Dimensions (mm)

| Diameter D1 (mm) | Thickness B | Central Bore d (mm) | Hub D2 (mm) | Bevel L (mm) | Pin Holes (mm) | Threaded Holes |
|------------------|-------------|---------------------|-------------|--------------|----------------|----------------|
| 610 | 4,76 | 68,26 | 216 | 197 | 4/11,5/108 | 4/1/4UNC/203.2 |
| 610 | 4,76 | 68,26 | 230 | 190 | 4/11,5/108 | 4/1/4UNC/203.2 |
| 610 | 4,76 | 82,55 | 230 | 190 | 4/11,5/108 | 4/1/4UNC/203.2 |
| 700 | 4,76 | 68,26 | 320 | 190 | 4/11,5/108 | 4/1/4UNC/203.2 |
| 360 | 5,00 | 60,00 | 320 | 245 | 4/1/4UNC/254 | 4/1/4UNC/289 |
| 810 | 6,00 | 60,00 | 320 | 245 | 4/1/4UNC/254 | 4/1/4UNC/289 |
| 870 | 6,00 | 60,00 | 380 | 245 | 4/1/4UNC/254 | 4/1/4UNC/289 |
| 1000 | 8,0 | 60,00 | 320 | 340 | 4/1/4UNC/254 | 4/1/4UNC/289 |
| 1200 | 8,0 | 60,00 | 520 | 340 | 4/1/4UNC/254 | 4/1/4UNC/289 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

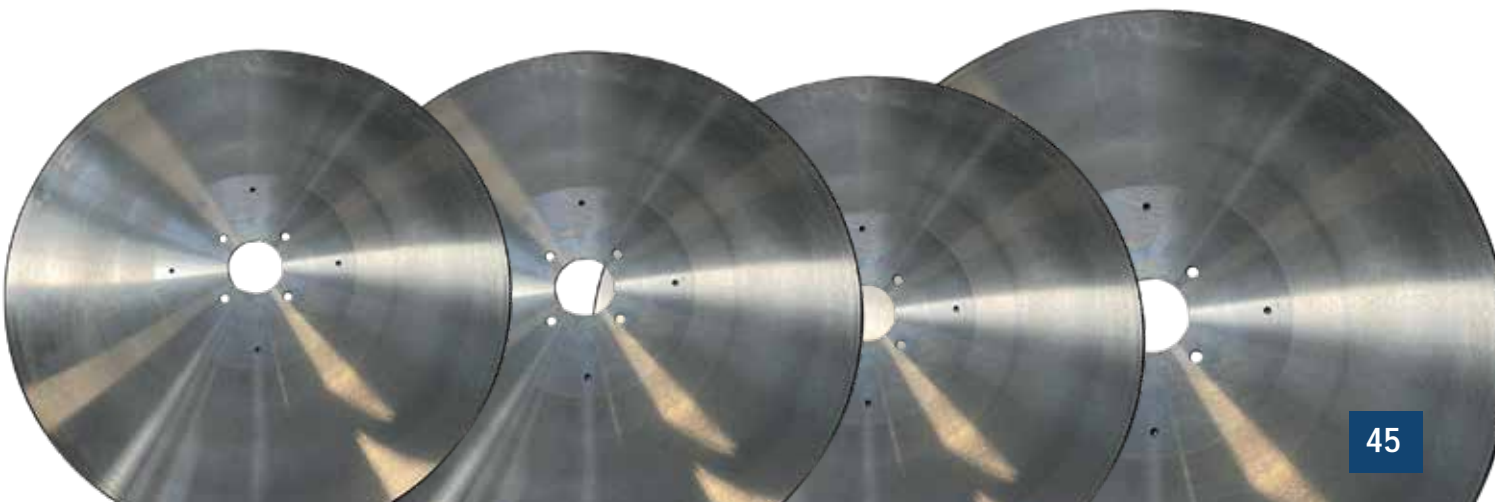
PROBLEMS AND SOLUTIONS

Below you will find a table that lists all known and essential kinds of trouble that can happen when operating log saw blades. Together with this you will find their possible causes (in the order of their probability) and recommendations on how to clear them.

| Kind of problem | Cause of problem | Solutions |
|-------------------------------------|---------------------------------|---|
| Lifetime of log saw blade too short | 1.Poor paper quality | → Look for changes in paper quality → Compare savings in paper quality with additional expenses for a bigger consumption of knives |
| | 2.Faulty grinding | → Check grinding wheels for their condition, if loaded dress them → Reduce number of cuts between grinding cycles → Reduce dwell time and increase frequency |
| | 3.Faults in the grinding system | → Check grinding wheels for wear and replace them → Check grinding wheels for right grit and/or composition and replace them → Check adjustment of grinding wheels and correct it if necessary → Check bearings of grinding wheels and replace them → Check contact pressure of grinding wheels for excessive air pressure or too heavy leaf springs and correct it |
| | 4.Condition of drive shaft | → Check for run-out and correct it or replace it → Check bearings and replace them, if necessary |
| | 5.Condition of hub | → Check hub for lateral run-out and correct or replace it, if necessary |



Hub with sufficient undercut between centre and clamping ring



PROBLEMS AND SOLUTIONS

| Kind of problem | Cause of problem | Solutions |
|--------------------------------------|--|--|
| Development of dust/ragged log edges | 1. Poor paper quality or abrasive core stock | Look for changes in paper quality and core stock quality → Compare savings in paper quality or core stock with additional expenses for a bigger consumption of knives |
| | 2. Pre-bevel of log saw blade blunt/not symmetrical | → Grind pre-bevel → Check pre-bevel is symmetrical 7°/side and adjust grinding wheels if necessary → Check pre-bevel is symmetrical 7°/side and adjust grinding wheels if necessary → Check if blade is perfectly round or eccentric (octagonally shaped). An octagonally shaped circular knife is either worn or victim of faults during sharpening resp. in the grinding system → Check if blade is perfectly round or eccentric (octagonally shaped). An octagonally shaped circular knife is either worn or victim of faults during sharpening resp. in the grinding system → Look for damages at the pre-bevel (cannot be corrected by the user) |
| | 3. Flapping (tip-whipping) of the blade during cutting | → Check blade for lateral runout (can only be corrected by the blade manufacturer) → Check lateral run-out of hub and correct it → Discuss bevel geometry with the blade maker in respect of density and diameter of log |



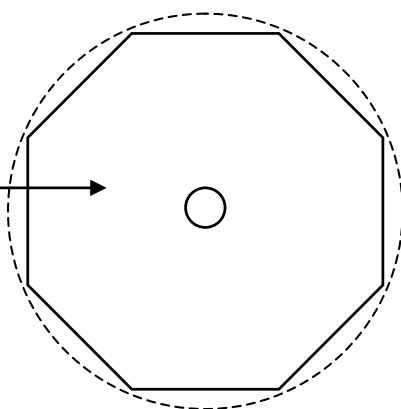
Ideal Condition:
Log Saw Blade on Test Stand
with minimum lateral run-out



PROBLEMS AND SOLUTIONS

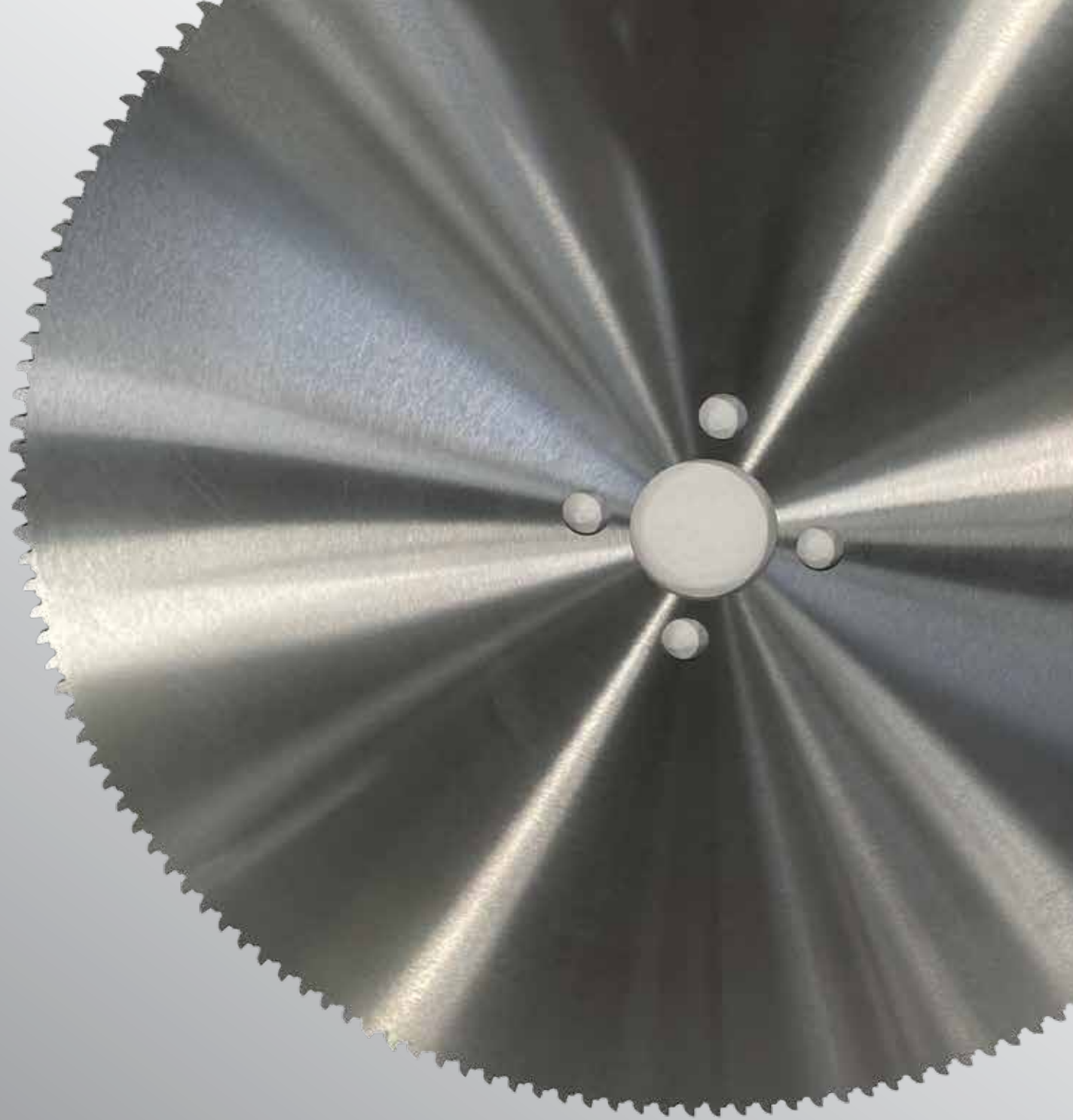
| Kind of problem | Cause of problem | Solutions |
|---|--|--|
| Angular cuts | 1. Pre-bevel is not symmetric | → Check pre-bevel for being symmetrically 7°/side and adjust grinding wheels if necessary |
| | 2. Cutting speed and feed speed too slow | → Compare actual values with machine maker's recommendation and correct them |
| | 3. Density of log too big | → Discuss bevel geometry with the blade maker in respect of density and diameter of log |
| | 4. Depth of cut is not sufficient | → Cutting depth should be adjusted in a way that the log saw blade overlaps the bottom end of the log clamping tube by ca. 6-7mm |
| Log or core crushing | 1. Pre-bevel of log saw blade blunt | → Sharpen the blade |
| | 2. Blade worn (out of round, stop signed) | → Install new log saw blade |
| | 3. Density of log too big | → Discuss bevel geometry with the blade manufacturer in respect of density and diameter of log) |
| | 4. Thickness of core too big | → Check if log can be wound on cores with less wall thickness |
| Fire in the machine | 1. Sparks shooting during grinding | → Check grinding conditions → Reduce development of dust → Clean the machine more frequent |
| Log saw blade eccentric, octagonally shaped | 1. Blade worn | → Blade diameter too small, pre-bevel gets longer and is more difficult to grind, install new blade |
| | 2. Blade is being overheated during grinding | → Check grinding conditions |

Octagonal shape of a worn blade or caused by faulty grinding



Geometrically round shaped knife (as it has to be)





SAW BODIES

“

Robust, Reliable And Long Lasting Azak Saw Bodies

SAW BLADE BODIES

We manufacture saw bodies for different applications and industries such as wood, metal and marble/concrete cutting. We can also manufacture saw bodies with different hardness and dimensions depending on the customer request.

| Application | Quality(mm) | Diameter(mm) | Thickness(mm) |
|-------------------------|----------------|--------------|---------------|
| Wood Cutting | 75Cr1, 80CrV2 | Ø 100- Ø1600 | 1,5-7 |
| Metal Cutting | 80CrV2, 75Cr1 | Ø 100- Ø1600 | 1,5-7 |
| Friction Saw | 80CrV2, 75Cr1 | Ø 200- Ø1600 | 2-10 |
| Marble/Concrete Cutting | 30MnB5, 28MnB5 | Ø 190- Ø1600 | 1,2-7 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."



MARBLE DISCS

| SOCKET DIAMETER (mm) | BODY DIAMETER (mm) | THICKNESS (mm) | BORE DIAMETER (mm) | TOOTH NUMBER |
|----------------------|--------------------|----------------|--------------------|--------------|
| 200 | 190 | 1,2 | 22-25,4-60 | 13 |
| 250 | 240 | 1,6 | 22-25,4-60 | 17 |
| 300 | 290 | 1,8 | 25,4-60 | 18-21 |
| 300 | 290 | 1,8 | 25,4-60 | 22-23 |
| 350 | 340 | 2,2 | 25,4-60 | 21-25 |
| 350 | 340 | 2,2 | 25,4-60 | 26-27 |
| 350 | 340 | 2,5 | 25,4-60 | 21-25 |
| 400 | 390 | 2,5 | 25,4-60 | 24-28 |
| 400 | 390 | 2,5 | 25,4-60 | 30 |
| 400 | 390 | 3,5 | 25,4-60 | 24-28 |
| 400 | 390 | 3,8 | 25,4-60 | 24-28 |
| 400 | 390 | 4,0 | 25,4-60 | 24-28 |
| 450 | 440 | 2,8 | 25,4-60 | 26-32 |
| 450 | 440 | 3,5 | 25,4-60 | 26-32 |
| 450 | 440 | 3,8 | 25,4-60 | 26-32 |
| 450 | 440 | 4,0 | 25,4-60 | 26-32 |
| 500 | 490 | 2,8 | 25,4-60 | 30-36 |
| 500 | 490 | 3,5 | 25,4-60 | 30-36 |
| 500 | 490 | 4,0 | 25,4-60 | 30-36 |
| 550 | 540 | 3,0 | 25,4-60 | 32-40 |
| 550 | 540 | 3,5 | 25,4-60 | 32-40 |
| 550 | 540 | 4,0 | 25,4-60 | 32-40 |
| 600 | 590 | 3,0 | 25,4-60 | 32-40 |
| 600 | 590 | 3,5 | 25,4-60 | 32-40 |
| 600 | 590 | 4,0 | 25,4-60 | 32-40 |
| 625 | 615 | 3,5 | 60-80 | 32-40 |
| 625 | 615 | 4,0 | 60-80 | 32-40 |
| 650 | 640 | 3,5 | 60-80 | 38-46 |
| 650 | 640 | 4,0 | 60-80 | 38-46 |
| 650 | 640 | 4,5 | 60-80 | 38-46 |
| 700 | 690 | 3,5 | 60-80 | 40-50 |
| 700 | 690 | 4,0 | 60-80 | 40-50 |
| 725 | 715 | 3,5 | 60-80 | 40-50 |
| 725 | 715 | 4,0 | 60-80 | 40-50 |
| 750 | 740 | 3,5 | 60-80 | 40-50 |
| 750 | 740 | 4,0 | 60-80 | 40-50 |
| 750 | 740 | 4,5 | 60-80 | 40-50 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

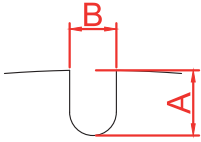
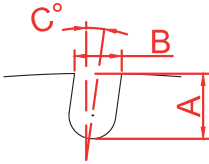
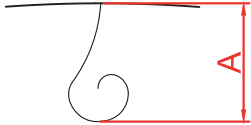
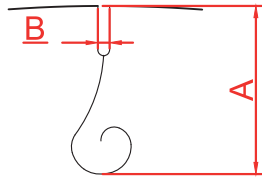
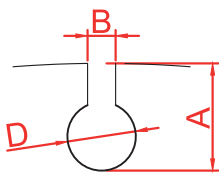
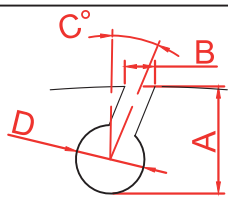


MARBLE DISCS

| SOCKET DIAMETER (mm) | BODY DIAMETER (mm) | THICKNESS (mm) | BORE DIAMETER (mm) | TOOTH NUMBER |
|----------------------|--------------------|----------------|--------------------|--------------|
| 800 | 790 | 3,5 | 60-80 | 46-57 |
| 800 | 790 | 4,0 | 60-80 | 46-57 |
| 800 | 790 | 4,5 | 60-80 | 46-57 |
| 850 | 840 | 3,5 | 60-80-100 | 50-58 |
| 850 | 840 | 4,0 | 60-80-100 | 50-58 |
| 850 | 840 | 4,5 | 60-80-100 | 50-58 |
| 900 | 884 | 3,5 | 80-100-120 | 64 |
| 900 | 884 | 4,5 | 80-100-120 | 64 |
| 900 | 884 | 5,0 | 80-100-120 | 64 |
| 1000 | 984 | 3,5 | 100-120 | 70 |
| 1000 | 984 | 4,5 | 100-120 | 70 |
| 1000 | 984 | 5,0 | 100-120 | 70 |
| 1000 | 984 | 5,5 | 100-120 | 70 |
| 1000 | 984 | 6,0 | 100-120 | 70 |
| 1050 | 1034 | 4,5 | 100-120 | 72 |
| 1050 | 1034 | 5,5 | 100-120 | 72 |
| 1050 | 1034 | 5,5 | 100-120 | 72 |
| 1050 | 1034 | 6,0 | 100-120 | 72 |
| 1100 | 1084 | 5,5 | 100-120-140 | 74 |
| 1200 | 1184 | 3,5 | 100-120-140 | 80 |
| 1200 | 1184 | 4,5 | 100-120-140 | 80 |
| 1200 | 1184 | 5,5 | 100-120-140 | 80 |
| 1200 | 1184 | 6,0 | 100-120-140 | 80 |
| 1250 | 1232 | 4,5 | 100-120-140 | 84 |
| 1250 | 1232 | 5,5 | 100-120-140 | 84 |
| 1250 | 1232 | 6,0 | 100-120-140 | 84 |
| 1300 | 1282 | 4,5 | 100-120-140 | 88 |
| 1300 | 1282 | 5,5 | 100-120-140 | 88 |
| 1300 | 1282 | 6,0 | 100-120-140 | 88 |
| 1350 | 1332 | 6,0 | 100-120-140 | 90 |
| 1400 | 1382 | 4,5 | 100-120-140 | 92 |
| 1400 | 1382 | 5,5 | 100-120-140 | 92 |
| 1400 | 1382 | 6,0 | 100-120-140 | 92 |
| 1400 | 1382 | 6,5 | 100-120-140 | 92 |
| 1500 | 1482 | 5,5 | 100-120-140 | 100 |
| 1500 | 1482 | 6,5 | 100-120-140 | 100 |
| 1600 | 1582 | 3,5 | 100-120-140 | 104 |
| 1600 | 1582 | 6,0 | 100-120-140 | 104 |
| 1600 | 1582 | 7,0 | 100-120-140 | 104 |

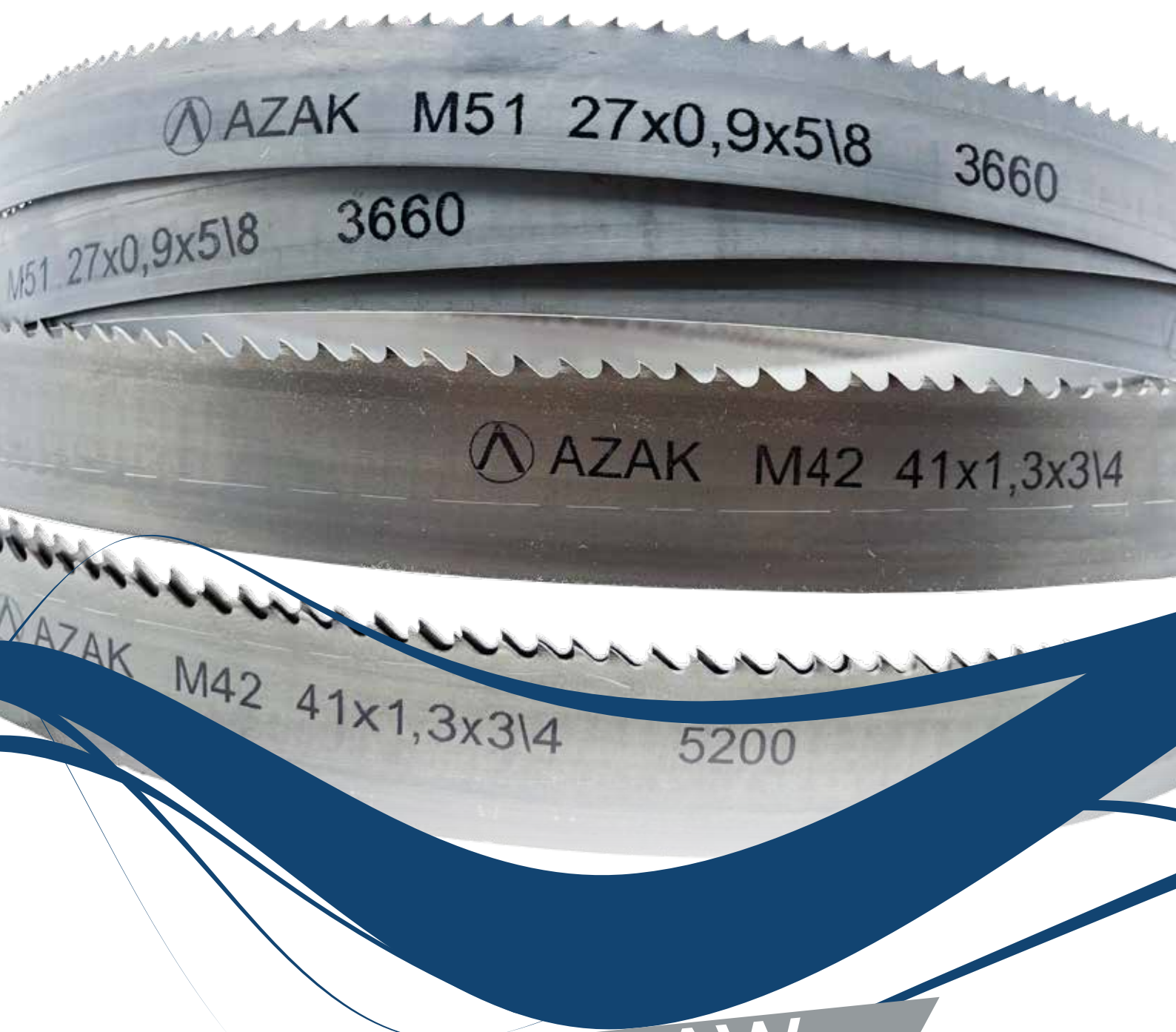
"The information given in the table are the standard values. We ask you to contact us in case of special requests."

MARBLE DISCS

| SLOT NAME | SLOT TYPE |
|-----------|---|
| S1 | <div> <div>S1 A/B </div> <div>S1 C°/A/B </div> </div> |
| S2 | <div>S2 A </div> |
| S3 | <div>S3 A/B </div> |
| S4 | <div> <div>S4 A/B/D </div> <div>S4 C°/A/B/D </div> </div> |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."







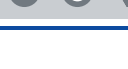


BAND SAW BLADES



THE RIGHT CHOICE FOR THE RIGHT CUT

Bi-Metal Band Saw Blades

| Description | Engineered for | Material cross-section | Page |
|-------------|----------------|---|------|
| M42-P | profile |  | 56 |
| M42-S | solid material |  | 57 |
| M42-M | mix |  | 58 |
| M51-M | mix |  | 59 |
| M51-S | solid material |  | 60 |

Bi-Metal

M42

Material no. 1.3247 hardness approx.
hardness approx.
68-69 HRC

M51

Material no. 1.3207 hardness approx.
69 HRC, with high tungsten with
high tungsten-and cobalt content.

Flexible:

The blade backer of our Bi-Metal Band Saw Blade consists of a special alloyed spring steel. Highly flexible at a hardness of about 50 HRC. The ideal basis for long fatigue life and excellent cutting performance.

Perfectly joint

Both materials are undetachably welded together by a special electron or laser beam.

All advantages

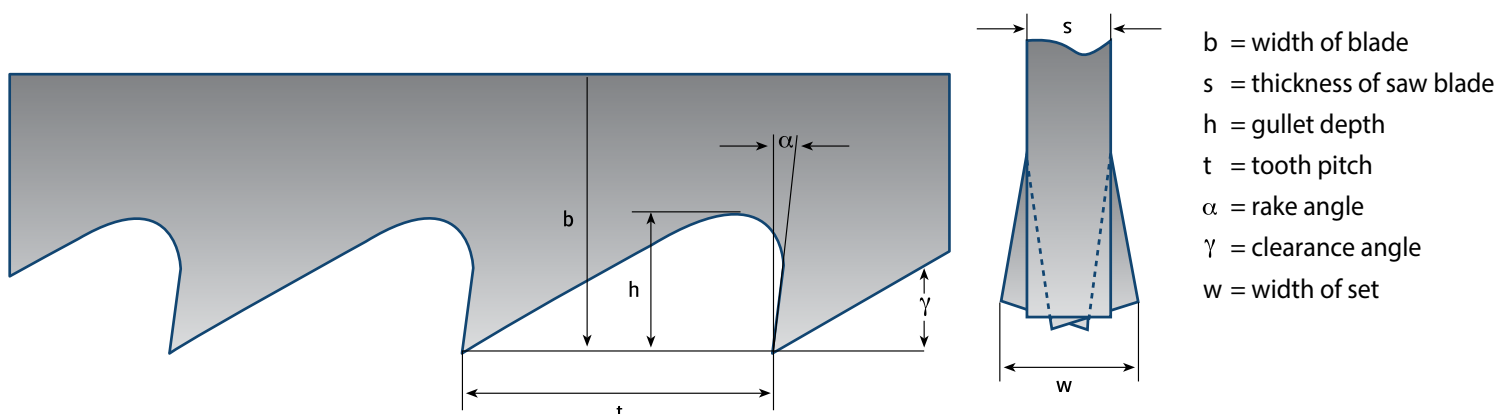
The high quality Bi-Metal band combines the flexibility of the spring steel backing with the enormous wear resistance of the high speed steel. Each tooth tip of the finished band is made of hardened HSS-steel, extremely durable for best performance.

Hard and wear resistant

Tooth tips made of hardened HSS-Steel in M quality obtained due to well-balanced hardening and fixed structure resulting in high wear resistance.

Band Saw Geometry

Terminology

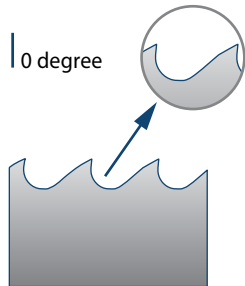


TOOTH FORMS

The right tooth form for best performance

Only the correctly selected tooth form allows efficient cutting with low vibration. Four basic types are available:

Standard tooth



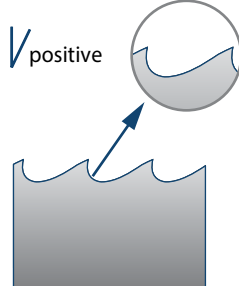
Designed for:

- short chipping materials
- light wall thickness

Data:

- rake angle 0°
- constant tooth pitch of
- 4 to 18 tpi

Hook tooth



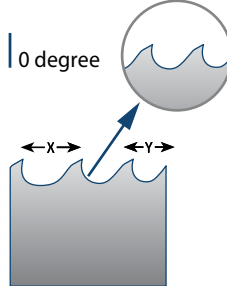
Designed for:

- long chipping materials
- large cross sections

Data:

- positive rake angle
- constant tooth pitch of
- 3 to 6 tpi

Variable tooth



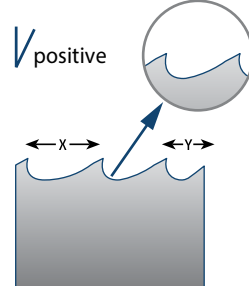
Designed for:

- low vibration cutting
- structurals

Data:

- rake angle 0°
- variable tooth pitch of
- 5/8 to 10/14 tpi

Variable tooth



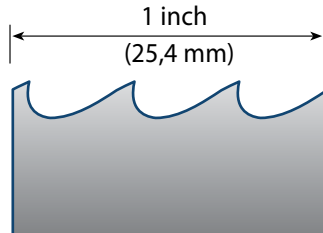
Designed for:

- low vibration cutting
- solid materials

Data:

- positive rake angle
- variable tooth pitch of
- 0,75/1,25 to 12/16 ZpZ

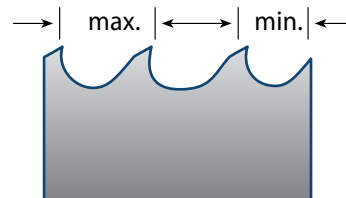
TOOTH PITCH



Constant tooth pitch

The tooth distance is equally spaced. The number of teeth per inch (25,4 mm) denotes the toothing of the saw blade.

Constant or variable?



Variable tooth pitch

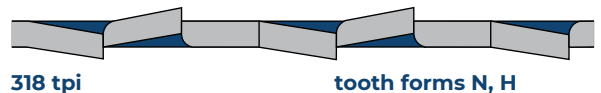
The tooth distances vary within a group of teeth. The smallest and the largest tooth pitch denotes the variable toothing of the saw blade.

TOOTH SET

What groups and waves can cause.

Beside the tooth pitch and the tooth form, the exact setting is essential for the performance of the sawblade. The correct clearance results from the corresponding setting. It avoids blade pinching, which is especially important in problematic steels. Width and type of set are precisely tailored to the cutting application.

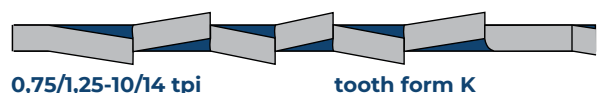
Standard raker set



318 tpi

tooth forms N, H

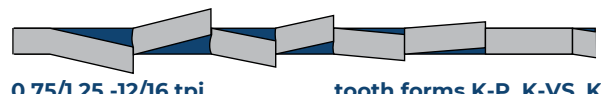
Standard group set



0,75/1,25-10/14 tpi

tooth form K

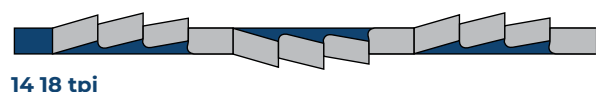
Variable group set



0,75/1,25 -12/16 tpi

tooth forms K-P, K-VS, K-X

Wavy set



14 18 tpi

CORRECT TOOTH PITCH – OPTIMUM PERFORMANCE

The choice of the right tooth pitch is decisive to achieve the optimum performance. Choose between the standard tooth with constant tooth pitch or the combination tooth with variable tooth pitch. The variable tooth is recommended for low-vibration sawing in problematic workpieces.

Recommendation to cut solid material



| Variable tooth pitch Cross section (mm) | Teeth per inch tpi |
|---|-----------------------|
| from 550 | 0,75 1,25 |
| 380 - 750 | 1 1,3 |
| 250 - 550 | 1,4 2 |
| 120 - 350 | 2 3 |
| 80 - 140 | 3 4 |
| 60 - 110 | 4 6 |
| 40 - 70 | 5 7 5 8 |
| 30 - 60 | 6 10 |
| 20 - 40 | 8 11 8 12 |
| to 25 | 10 14 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

Recommendation to cut tubes and structurals

| Thin wall structurals (0° - 7° rake angle) | | | | | | | |
|--|----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Wall thickness (S) in mm | Diameter of structural (D) in mm | | | | | | |
| | 20 | 40 | 60 | 80 | 100 | 120 | 150 |
| 2 | 14 | 14 | 14 | 14 | 14 | 14 | 10 14 |
| 3 | 14 | 14 | 14 | 14 | 10 14 | 10 14 | 8 11 8 12 |
| 4 | 14 | 14 | 10 14 | 10 14 | 8 11 8 12 | 8 11 8 12 | 6 10 |
| 5 | 14 | 10 14 | 10 14 | 8 11 8 12 | 8 11 8 12 | 6 10 | 6 10 |
| 6 | 14 | 10 14 | 8 11 8 12 | 8 11 8 12 | 6 10 | 6 10 | 5 7 5 8 |
| 8 | 14 | 8 11 8 12 | 6 10 | 6 10 | 5 7 5 8 | 5 7 5 8 | 5 7 5 8 |
| 10 | - | 6 10 | 6 10 | 5 7 5 8 | 5 7 5 8 | 5 7 5 8 | - |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

The choice of the right tooth has special influence on the cutting result on tubes and structurals. Variable tooth has proven to be the most favourable tooth form. The required tooth pitch is depending on the wall thickness and dimensions of the structurals. The recommendations shown here refer to single cuts. When two or more structurals are cut at the same time, double the wall thickness needs to be considered.

| Heavy wall structurals (positive rake angle) | | | | | | | | |
|--|----------------------------------|-------|-------|-------|-------|-------|---------|---------|
| Wall thickness (S) in (mm) | Diameter of structural (D) in mm | | | | | | | |
| | 80 | 100 | 120 | 150 | 200 | 300 | 500 | 750 |
| 10 | - | - | - | 4 6 | 4 6 | 4 6 | 3 4 | 2 3 |
| 15 | 4 6 | 4 6 | 4 6 | 4 6 | 4 6 | 3 4 | 2 3 | 2 3 |
| 20 | 4 6 | 4 6 | 4 6 | 4 6 | 3 4 | 3 4 | 2 3 | 2 3 |
| 30 | 4 6 | 4 6 | 4 6 | 3 4 | 3 4 | 2 3 | 2 3 | 2 3 |
| 50 | - | - | 3 4 | 3 4 | 2 3 | 2 3 | 2 3 | 1,4 2 |
| 80 | - | - | - | - | 2 3 | 2 3 | 1,4 2 | 1,4 2 |
| 100 | - | - | - | - | - | 2 3 | 1,4 2 | 1,4 2 |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

BI-METAL AND BAND SAW BLADES

BAND SAW BLADES

For each cutting operation the right choice.

| Product name | | M42-P | M42-S | M42-M | M51-M | M51-S |
|---------------------------------|----------|-------|-------|-------|-------|-------|
| Page of catalogue | | 56 | 57 | 58 | 59 | 60 |
| Material dimension (mm) | | | | | | |
| - Structural steels | <70 | | | | | |
| - Case-hardening steels | 80 - 350 | | | | | |
| - Free machining steels | >350 | | | | | |
| - High speed steels | <70 | | | | | |
| - Cold-work steels | 80 - 350 | | | | | |
| | >350 | | | | | |
| - Nitride steels | <70 | | | | | |
| - Heat treatable steels | 80 - 350 | | | | | |
| - Hot working steels | >350 | | | | | |
| - Surface hardened steel shafts | <70 | | | | | |
| - Hardened steels up to HRC62 | 80 - 350 | | | | | |
| - Hardchromed materials | >350 | | | | | |
| - Steel castings | <70 | | | | | |
| - Cast irons | 80 - 350 | | | | | |
| | >350 | | | | | |
| - Aluminium+ alloys | <70 | | | | | |
| - Aluminium alloys with silicon | 80 - 350 | | | | | |
| | >350 | | | | | |

For each cutting operation the right choice.

| Product name | | M42-P | M42-S | M42-M | M51-M | M51-S |
|------------------------------|----------|-------|-------|-------|-------|-------|
| Page of catalogue | | 56 | 57 | 58 | 59 | 60 |
| Material dimension (mm) | | | | | | |
| - Unalloyed tool steels | <70 | | | | | |
| - Spring steels | 80 - 350 | | | | | |
| - Ball bearing steel | >350 | | | | | |
| - Stainless steels | <70 | | | | | |
| | 80 - 350 | | | | | |
| | >350 | | | | | |
| - High temperature steels | <70 | | | | | |
| - Heat resistant steels | 80 - 350 | | | | | |
| | >350 | | | | | |
| - High tensile steels | <70 | | | | | |
| - Titanium + titanium alloys | 80 - 350 | | | | | |
| - Nickel alloys | >350 | | | | | |
| - Aluminium | <70 | | | | | |
| - Copper | 80 - 350 | | | | | |
| | >350 | | | | | |
| - Brass | <70 | | | | | |
| - Bronze | 80 - 350 | | | | | |
| - Red brass | >350 | | | | | |

Qualification: ● = very good ● = good

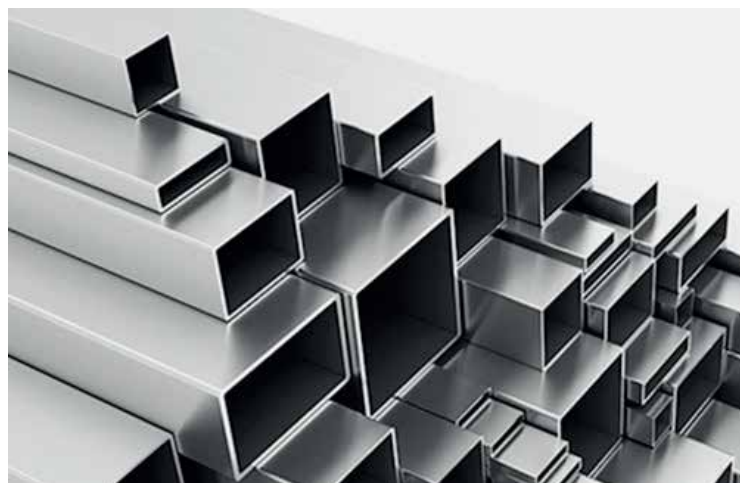
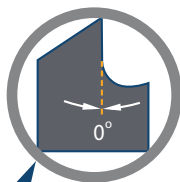


M42-P

The fabrication professional for light and medium wall thicknesses.

Engineered for:

- structurals with light or medium walls
- short chipping materials
- sheet metal on vertical band saw machines



| Dimensions (mm) | inch | Tooth | | | |
|--------------------|---------------|-------|------|------|-------|
| | | 5/8 | 6/10 | 8/12 | 10/14 |
| 6 x 0,90 | 1/4 x 0,035 | | | | 👍 |
| 10 x 0,90 | 3/8 x 0,035 | | | | 👍 |
| 13 x 0,65 | 1/2 x 0,025 | 👍 | 👍 | 👍 | 👍 |
| 13 x 0,90 | 1/2 x 0,035 | | 👍 | 👍 | 👍 |
| 20 x 0,90 | 3/4 x 0,035 | 👍 | 👍 | 👍 | 👍 |
| 27 x 0,90 | 1 x 0,035 | 👍 | 👍 | 👍 | 👍 |
| 34 x 1,10 | 1 1/4 x 0,042 | 👍 | 👍 | 👍 | |
| 41 x 1,30 | 1 1/2 x 0,050 | 👍 | 👍 | | |

👍 = Variable tooth

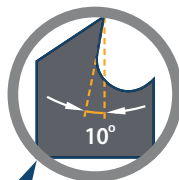
"The information given in the table are the standard values. We ask you to contact us in case of special requests."

M42-S

Perfect for materials of medium to large dimensions.

Engineered for:

- production band saw machines
- thick walled structurals
- tensile strengths of up to 1400 N/mm²
- all-purpose use for steels and non-ferrous metals



| Dimensions | | Tooth | | | | |
|------------|---------------|-----------|-------|-----|-----|-----|
| (mm) | inch | 0,75/1,25 | 1,4/2 | 2/3 | 3/4 | 4/6 |
| 20 x 0,90 | 3/4 x 0,035 | | | | | 👍 |
| 27 x 0,90 | 1 x 0,035 | | | 👍 | 👍 | 👍 |
| 34 x 1,10 | 1 1/4 x 0,042 | | 👍 | 👍 | 👍 | 👍 |
| 41 x 1,30 | 1 1/2 x 0,050 | | 👍 | 👍 | 👍 | 👍 |
| 54 x 1,30 | 2 x 0,050 | | 👍 | 👍 | 👍 | 👍 |
| 54 x 1,60 | 2 x 0,063 | 👍 | 👍 | 👍 | 👍 | 👍 |
| 67 x 1,60 | 2 5/8 x 0,063 | 👍 | 👍 | 👍 | | |
| 80 x 1,60 | 3 x 0,063 | 👍 | 👍 | | | |

👍 = Variable tooth

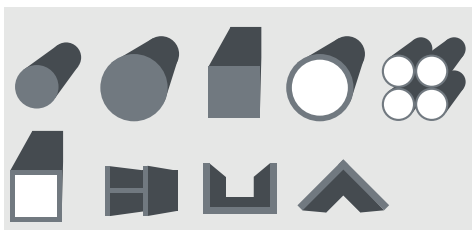
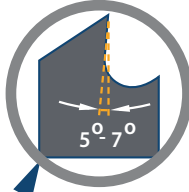
"The information given in the table are the standard values. We ask you to contact us in case of special requests."

M42-M

The multi-purpose blade for small and medium cross-sections.

Engineered for

- steel beams, profiles and tubes
- mixed materials



| Dimensions | | Tooth | | | | |
|------------|---------------|-------|-----|-----|-----|------|
| (mm) | inch | 2/3 | 3/4 | 4/6 | 5/7 | 8/11 |
| 20 x 0,90 | 3/4 x 0,035 | | | 👍 | 👍 | 👍 |
| 27 x 0,90 | 1 x 0,035 | | 👍 | 👍 | 👍 | 👍 |
| 34 x 1,10 | 1 1/4 x 0,042 | 👍 | 👍 | 👍 | 👍 | |
| 41 x 1,30 | 1 1/2 x 0,050 | 👍 | 👍 | 👍 | | |
| 54 x 1,30 | 2 x 0,050 | | 👍 | 👍 | | |
| 54 x 1,60 | 2 x 0,063 | 👍 | 👍 | 👍 | | |
| 67 x 1,60 | 2 5/8 x 0,063 | 👍 | 👍 | | | |

👍 = Variable tooth

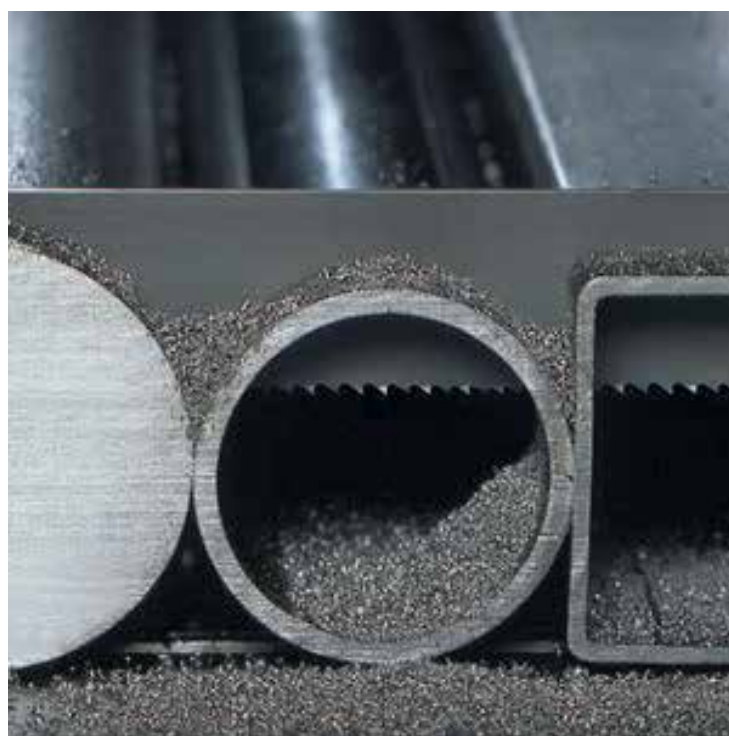
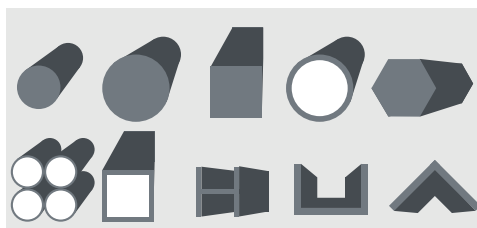
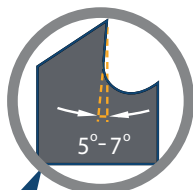
"The information given in the table are the standard values. We ask you to contact us in case of special requests."

M51-M

The pro with particularly wear-resistant teeth.
For sawing processes using minimal lubrication.
Powerful at high cutting speeds and feeds.

Engineered for:

- steel beams, profiles and pipes
- mixed cross-sections



| Dimensions | | Tooth | | |
|------------|---------------|-------|-----|-----|
| (mm) | inch | 2/3 | 2/3 | 2/6 |
| 34 x 1,10 | 1 1/4 x 0,042 | | 👍 | 👍 |
| 41 x 1,30 | 1 1/2 x 0,050 | 👍 | 👍 | 👍 |
| 54 x 1,30 | 2 x 0,050 | | 👍 | |
| 54 x 1,60 | 2 x 0,063 | 👍 | 👍 | |
| 67 x 1,60 | 2 5/8 x 0,063 | 👍 | 👍 | 👍 |

👍 = Variable tooth

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

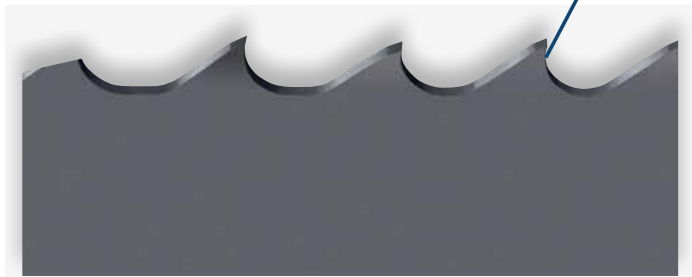
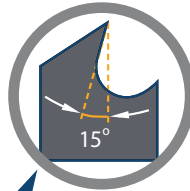


M51-S

Extra wear resistant teeth made of powder metallurgical HSS-steel.

Engineered for:

- hard and tough materials up to 1700 N/mm²
- stainless steel
- copper and copper based alloys
- titanium and titanium based alloys
- thick walled structurals



| Dimensions | | Tooth | | | | | | |
|------------|---------------|-----------|--------|-------|-----|-----|-----|-----|
| (mm) | inch | 0,75/1,25 | 1 /1,3 | 1,4/2 | 2/3 | 3/4 | 4/6 | 5/8 |
| 27 x 0,90 | 1 x 0,035 | | | | 👍 | 👍 | 👍 | 👍 |
| 34 x 1,10 | 1 1/4 x 0,042 | | | | 👍 | 👍 | 👍 | |
| 41 x 1,30 | 1 1/2 x 0,050 | | | 👍 | 👍 | 👍 | | |
| 54 x 1,60 | 2 x 0,063 | | 👍 | 👍 | 👍 | | | |
| 67 x 1,60 | 2 5/8 x 0,063 | 👍 | 👍 | 👍 | 👍 | | | |
| 80 x 1,60 | 3 x 0,063 | 👍 | 👍 | 👍 | | | | |

👍 = Variable tooth with special geometry

"The information given in the table are the standard values. We ask you to contact us in case of special requests."

BASIC MAINTENANCE

Scheduled maintenance of sawing machines has always been necessary for proper and efficient cutting, but for today's super alloys that requirement is more important than ever. Besides following the manufacturer's maintenance instructions, attending to these additional items will help ensure long life and efficient operation.

Band Wheels – Remove any chips. Make sure they turn freely.

Blade Tension – Use a tension meter to ensure accuracy.

Blade Tracking – Make sure the blade tracks true and rides correctly in the guides.

Chip Brush – Engage properly to keep chips from re-entering the cut.

Guides – Make sure guides are not chipped or cracked. Guides must hold the blade with the right pressure and be positioned as close as possible to the workpiece.

Guide Arm – For maximum support, move as close as possible to the workpiece.

Sawing Fluid – Be sure to use clean, properly Test for ratio with a refractometer and visually inspect to be sure. If new fluid is needed, mix properly, starting with water then adding lubricating fluid according to the manufacturer's recommendations.

SAWING PROBLEMS AND SOLUTIONS

Table Of Contents

- | | |
|---|---|
| 1 Heavy Even Wear On Tips and Corners Of Teeth | 11 Uneven Wear Or Scoring On The Sides Of Band |
| 2 Wear On Both Sides Of Teeth | 12 Heavy Wear And/Or Swagging On Back Edge |
| 3 Wear On One Side Of Teeth | 13 Butt Weld Breakage |
| 4 Chipped Or Broken Teeth | 14 Heavy Wear In Only The Smallest Gullets |
| 5 Body Breakage Or Cracks From Back Edge | 15 Body Breaking – Fracture Traveling In An Angular Direction |
| 6 Tooth Strippage | 16 Body Breakage Or Cracks From Gullets |
| 7 Chips Welded To Tooth Tips | 17 Band Is Twisted Into A Figure "8" Configuration |
| 8 Gullets Loading Up With Material | 18 Used Band Is "Long" On The Tooth Edge |
| 9 Discolored Tips Of Teeth Due To Excessive Frictional Heat | 19 Used Band Is "Short" On The Tooth Edge |
| 10 Heavy Wear On Both Sides Of Band | 20 Broken Band Shows A Twist In Band Length. |



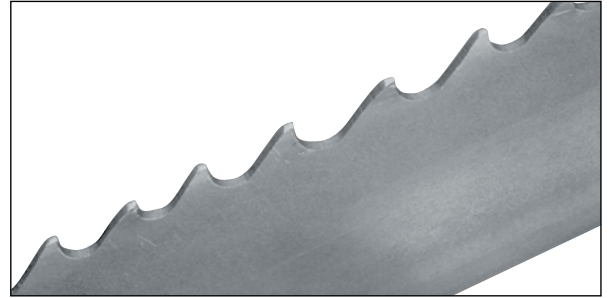
SAWING PROBLEMS AND SOLUTIONS

Heavy even wear on tips and corners of teeth

The wear on teeth is smooth across the tips and the corners of set teeth have become rounded.

PROBABLE CAUSE:

- A. Improper break-in procedure.
- B. Excessive band speed for the type of material being cut. This generates a high tooth tip temperature resulting in accelerated tooth wear.
- C. Low feed rate causes teeth to rub instead of penetrate. This is most common on work hardened materials such as stainless and tool steels.
- D. Hard materials being cut such as "Flame Cut Edge" or abrasive materials such as "Fiber Reinforced Composites".
- E. Insufficient sawing fluid due to inadequate supply, improper ratio, and/or improper application.

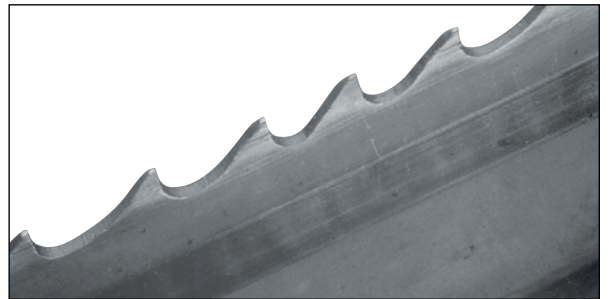


Wear on both sides of teeth

The side of teeth on both sides of band have heavy wear markings.

PROBABLE CAUSE:

- A. Broken, worn or missing back-up guides allowing teeth to contact side guides.
- B. Improper side guides for band width.
- C. Backing the band out of an incomplete cut.

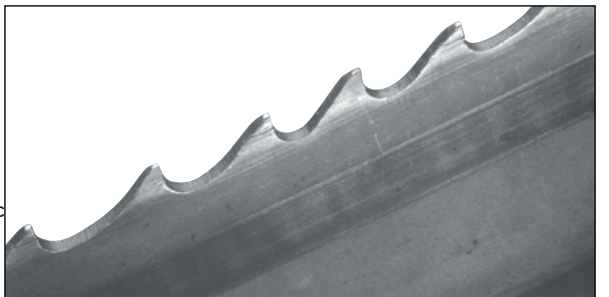


Wear on one side of teeth

Only one side of teeth has heavy wear markings.

PROBABLE CAUSE:

- A. Worn wheel flange, allowing side of teeth to contact wheel surface or improper tracking on flangeless wheel.
- B. Loose or improperly positioned side guides.
- C. Blade not perpendicular to cut.
- D. Blade rubbing against cut surface on return stroke of machine head.
- E. The teeth rubbing against a part of machine such as chip brush assembly, guards, etc.



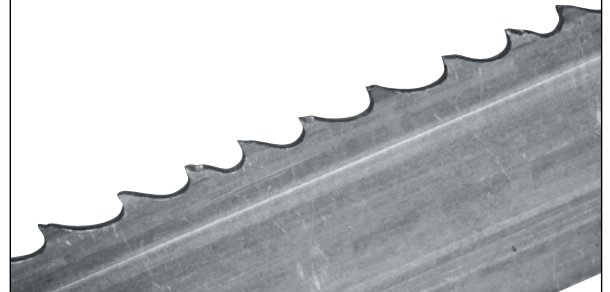
SAWING PROBLEMS AND SOLUTIONS

Chipped or broken teeth

A scattered type of tooth breakage on tips and corners of the teeth

PROBABLE CAUSE:

- A. Improper break-in procedure.
- B. Improper blade selection for application.
- C. Handling damage due to improper opening of folded band.
- D. Improper positioning or clamping of material.
- E. Excessive feeding rate or feed pressure.
- F. Hitting hard spots or hard scale in material.

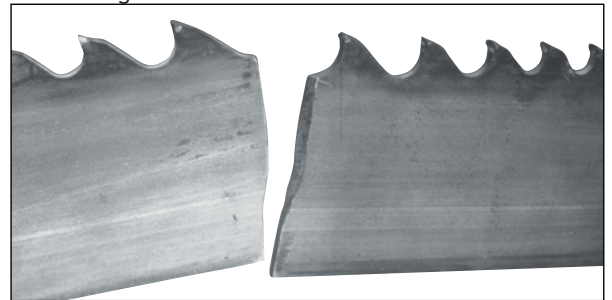


Body breakage or cracks from back edge

The fracture originates from the back edge of band. The origin of the fracture is indicated by a flat area on the fracture surface.

PROBABLE CAUSE:

- A. Excessive back-up guide "preload" will cause back edge to work harden which results in cracking.
- B. Excessive feed rate.
- C. Improper band tracking – back edge rubbing heavy on wheel flange.
- D. Worn or defective back-up guides.
- E. Improper band tension.
- F. Notches in back edge from handling damage.

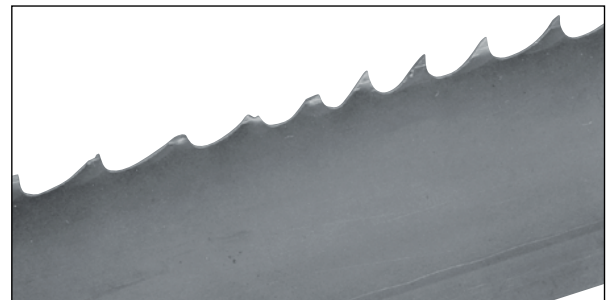


Tooth strippage

Section or sections of teeth which broke from the band backing.

PROBABLE CAUSE:

- A. Improper or lack of break-in procedure.
- B. Worn, missing or improperly positioned chip brush.
- C. Excessive feeding rate or feed pressure.
- D. Movement or vibration of material being cut.
- E. Improper tooth pitch for cross sectional size of material being cut.
- F. Improper positioning of material being cut.
- G. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.
- H. Hard spots in material being cut.
- I. Band speed too slow for grade of material being cut.



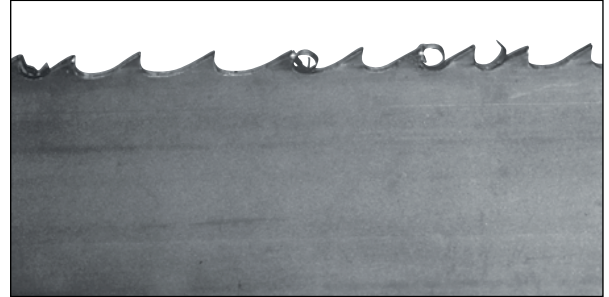
SAWING PROBLEMS AND SOLUTIONS

Chips welded to tooth tips

High temperature or pressure generated during the cut bonding the chips to the tip and face of teeth

PROBABLE CAUSE:

- A. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.
- B. Worn, missing or improperly positioned chip brush.
- C. Improper band speed.
- D. Improper feeding rate.

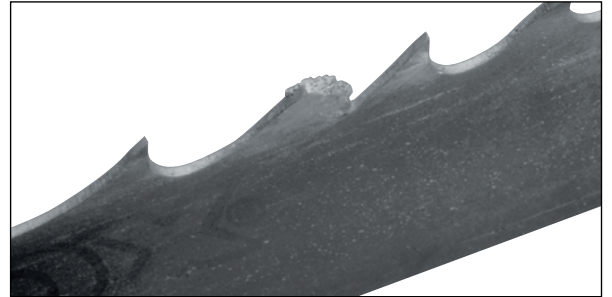


Gullets loading up with material

Gullet area has become filled with material being cut.

PROBABLE CAUSE:

- A. Too fine of a tooth pitch – insufficient gullet capacity.
- B. Excessive feeding rate producing too large of a chip.
- C. Worn, missing or improperly positioned chip brush.
- D. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.

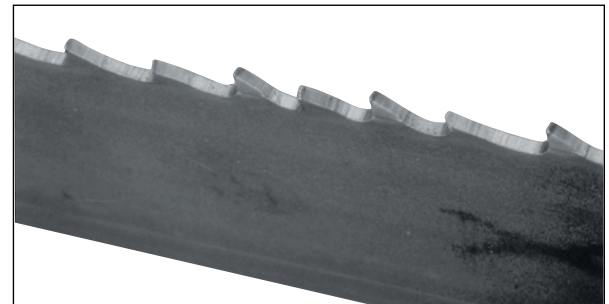


Discolored tips of teeth due to excessive frictional heat

The tooth tips show a discolored surface from generating an excessive amount of frictional heat during use.

PROBABLE CAUSE:

- A. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.
- B. Excessive band speed.
- C. Improper feeding rate.
- D. Band installed backwards.

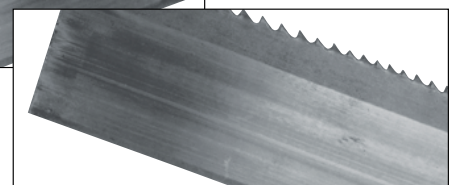
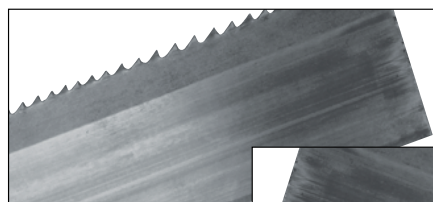


Heavy wear on both sides of band

Both sides of band have heavy wear patterns.

PROBABLE CAUSE:

- A. Chipped or broken side guides.
- B. Side guide adjustment may be too tight.
- C. Insufficient flow of sawing fluid through the side guides.
- D. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.



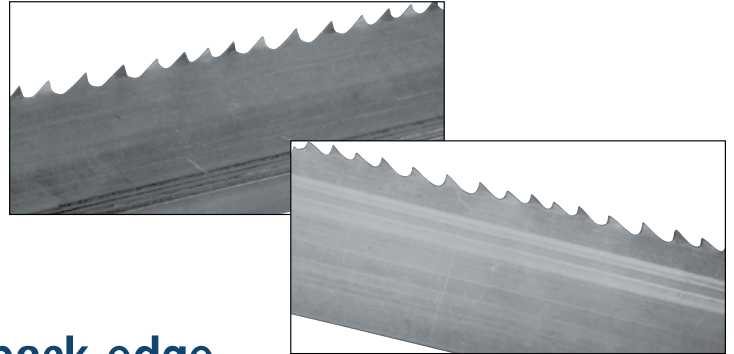
SAWING PROBLEMS AND SOLUTIONS

Uneven wear or scoring on the sides of band

Wear patterns are near gullet area on one side and near back edge on opposite side.

PROBABLE CAUSE:

- A. Loose side guides.
- B. Chipped, worn or defective side guides.
- C. Band is rubbing on part of the machine.
- D. Guide arms spread to maximum capacity.
- E. Accumulation of chips in side guides

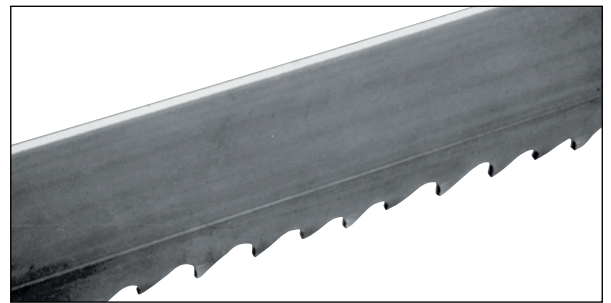


Heavy wear and/or swagging on back edge

Heavy back edge wear will have a polished appearance or abnormal grooves worn into surface. Swaging of corners can also occur

PROBABLE CAUSE:

- A. Excessive feed rate.
- B. Excessive back-up guide "preload".
- C. Improper band tracking – back edge rubbing heavy on wheel flange.
- D. Worn or defective back-up guides.



Butt weld breakage

To determine if the band broke at the weld, inspect the sides at the fracture to see if there are grind markings from the weld finishing process.

PROBABLE CAUSE:

- A. Any of the factors that cause body breaks can also cause butt weld breaks.
(See Observations 5, 15, and 16)

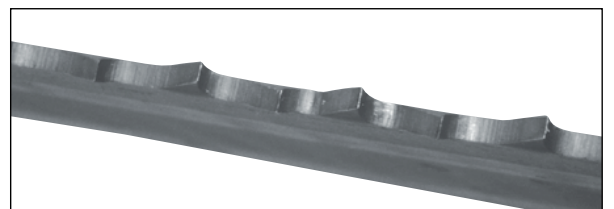


Heavy wear in only the smallest gullets

Heavy wear in only the smallest gullets is an indication that there is a lack of gullet capacity for the chips being produced.

PROBABLE CAUSE:

- A. Excessive feeding rate.
- B. Too slow of band speed.
- C. Using too fine of a tooth pitch for the size of material being cut.



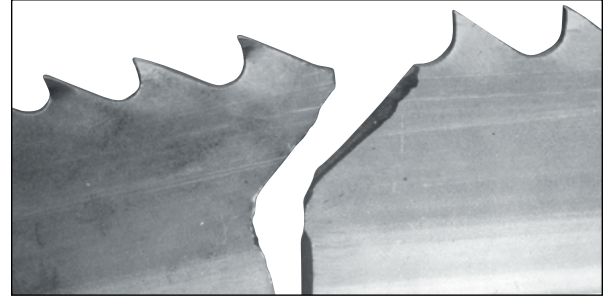
SAWING PROBLEMS AND SOLUTIONS

Body breaking – fracture traveling in an angular direction

The fracture originates in the gullet and immediately travels in an angular direction into the backing of band.

PROBABLE CAUSE:

- A. An excessive twist type of stress existed.
- B. Guide arms spread to capacity causing excessive twist from band wheel to guides.
- C. Guide arms spread too wide while cutting small cross sections.
- D. Excessive back-up guide "preload"

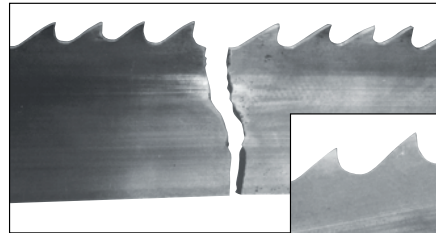


Body breakage or cracks from gullets

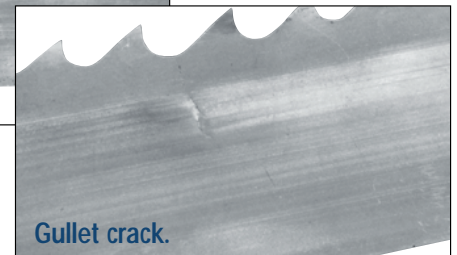
The origin of the fracture is indicated by a flat area on the fracture surface.

PROBABLE CAUSE:

- A. Excessive back-up guide "preload".
- B. Improper band tension.
- C. Guide arms spread to maximum capacity.
- D. Improper beam bar alignment.
- E. Side guide adjustment is too tight.
- F. Excessively worn teeth.



Body break
from gullet.



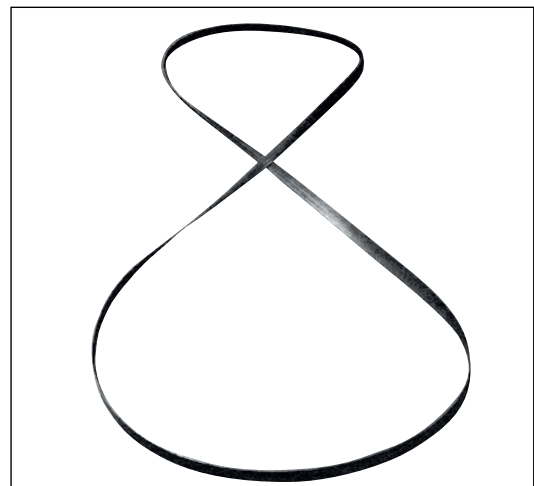
Gullet crack.

Band is twisted into a figure "8" configuration

The band does not retain its normal shape while holding the sides of loop together. This indicates the flatness has been altered during use.

PROBABLE CAUSE:

- A. Excessive band tension.
- B. Any of the band conditions which cause the band to be long (18) or short (19) on tooth edge.
- C. Cutting a tight radius.



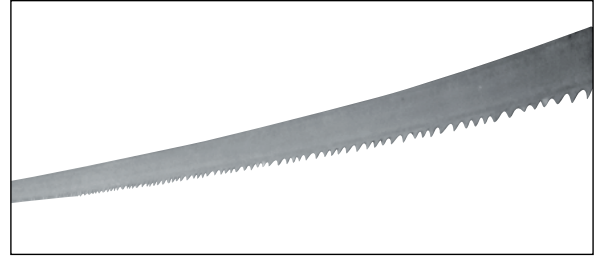
SAWING PROBLEMS AND SOLUTIONS

Used band is "long" on the tooth edge

"Long" on the tooth edge is a term used to describe the straightness of the band. The teeth are on the outside of the arc when the strip is lying on a flat surface.

PROBABLE CAUSE:

- A. Side guides are too tight – rubbing near gullets.
- B. Excessive "preload" – band riding heavily against back-up guides.
- C. Worn band wheels causing uneven tension.
- D. Excessive feeding rate.
- E. Guide arms are spread to maximum capacity.
- F. Improper band tracking – back edge rubbing heavy on wheel flange.

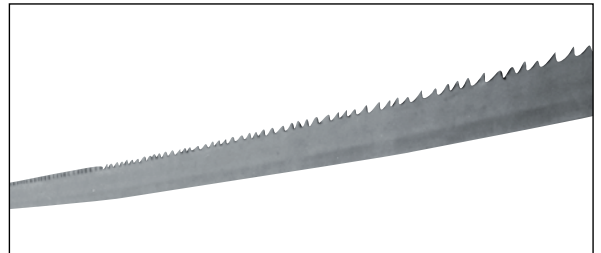


Used band is "short" on the tooth edge

"Short" on the tooth edge is a term used to describe the straightness of the band. The teeth are on the inside of the arc when the strip is lying on a flat surface.

PROBABLE CAUSE:

- A. Side guides are too tight – rubbing near back edge.
- B. Worn band wheels causing uneven tension.
- C. Guide arms are spread too far apart.
- D. Excessive feeding rate.

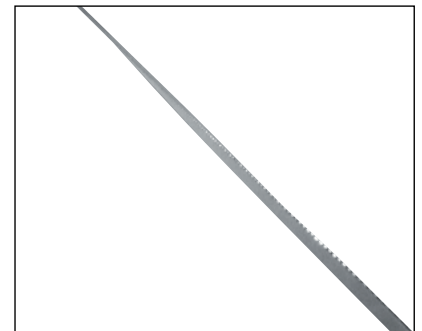


Broken band shows a twist in band length

When a broken band lying on a flat surface displays a twist from one end to the other, this indicates the band flatness has been altered during use.

PROBABLE CAUSE:

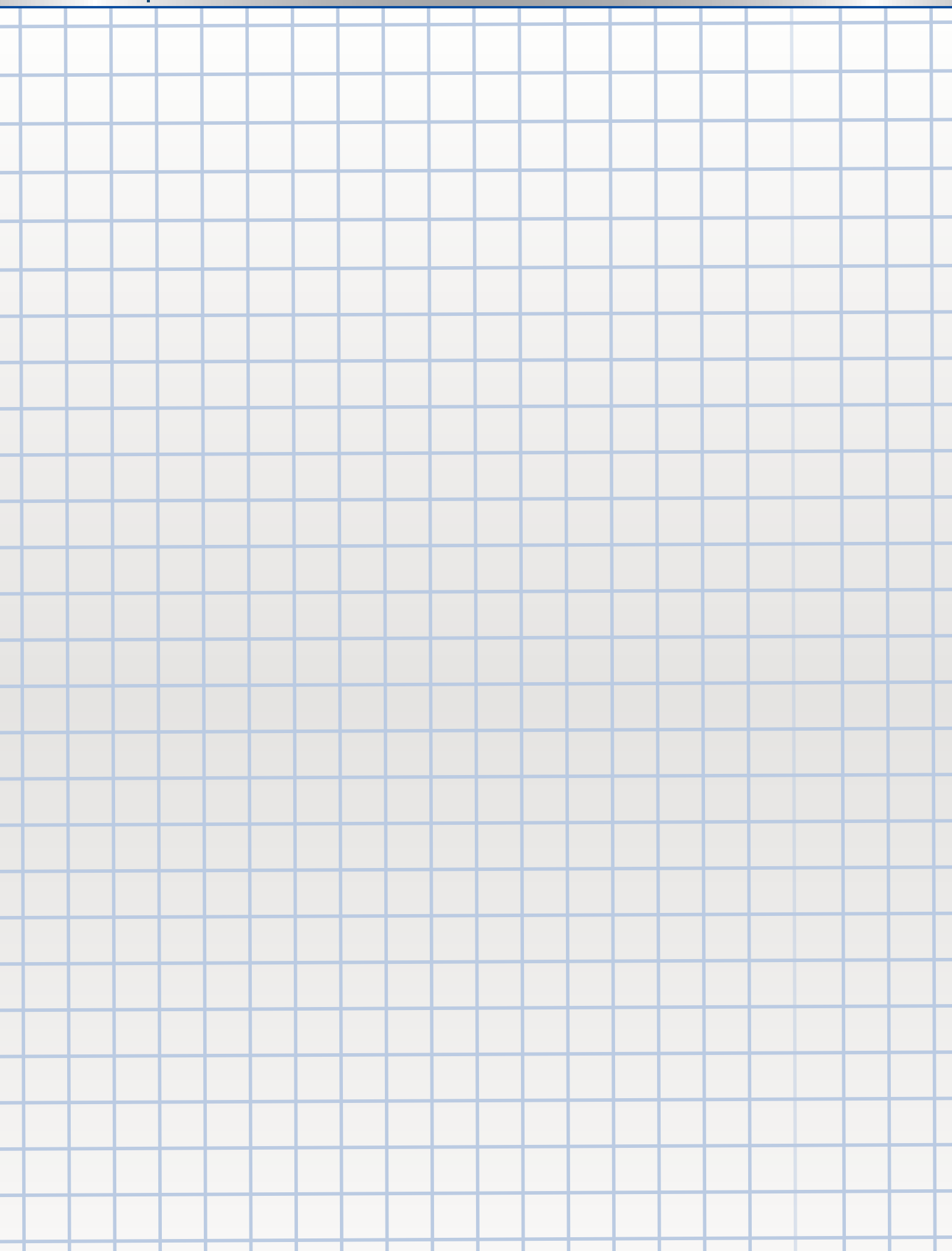
- A. Excessive band tension
- B. Any of the band conditions which cause the band to be long (18) or short (19) on tooth edge.
- C. Cutting a tight radius.

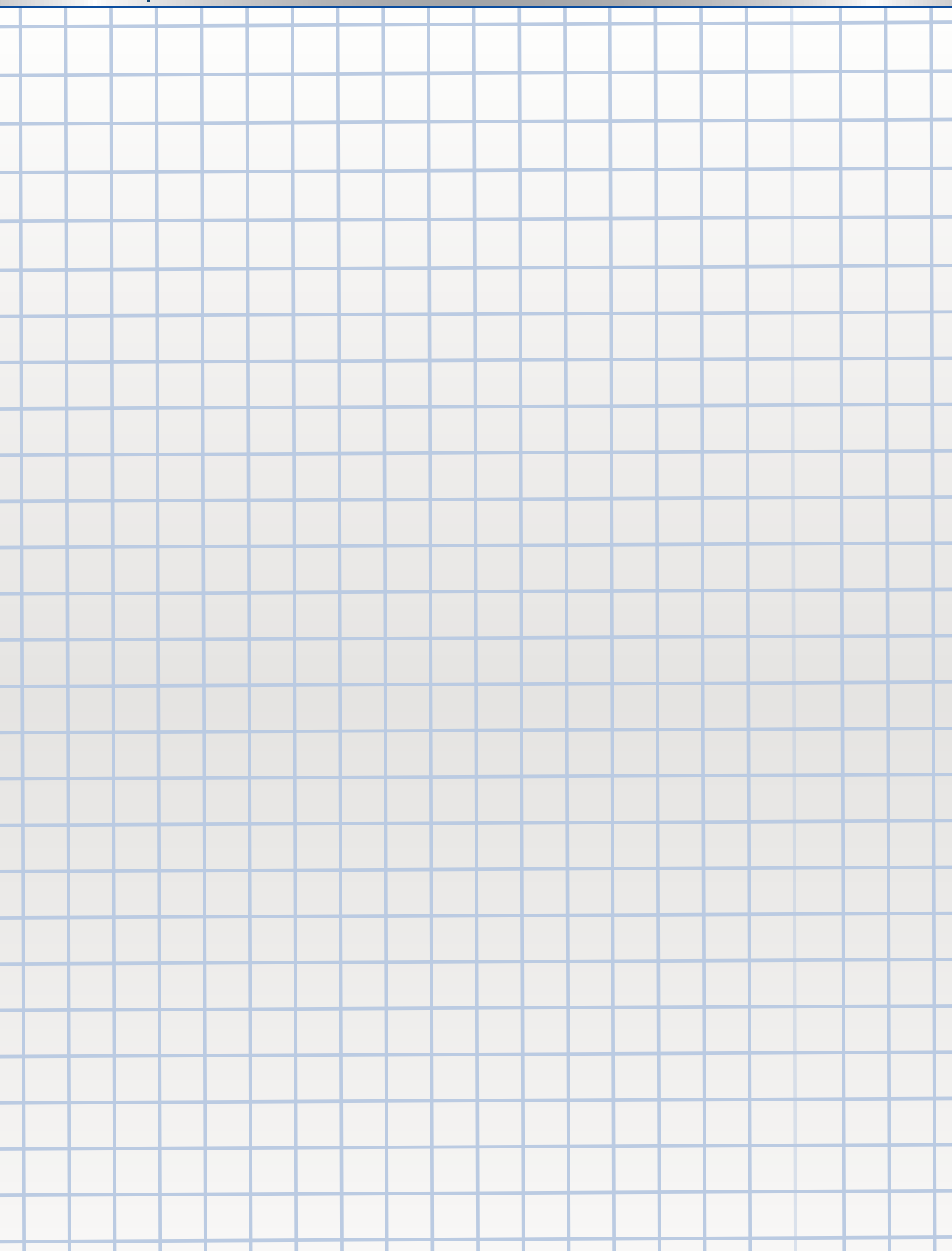


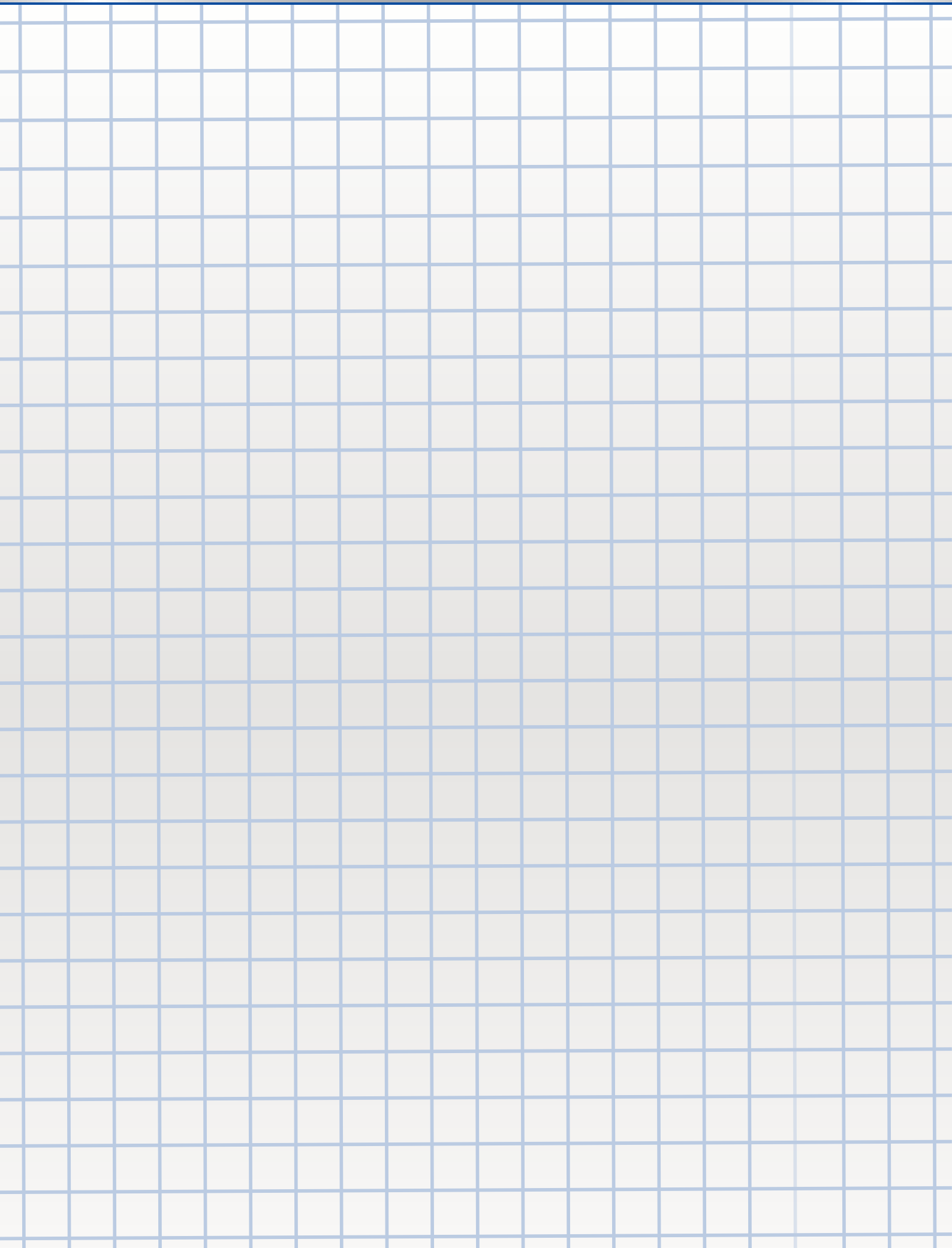
POSSIBLE CAUSES OF BLADE FAILURE

| OBSERVATION | BAND SPEED | BAND WHEELS | BREAK-IN PROCEDURE | CHIP BRUSH | SAWING FLUID | FEEDING RATE | SIDE GUIDES | BACKUP GUIDES | PRELOAD CONDITION | BAND TENSION | BAND TRACKING | TOOTH PITCH |
|---|------------|-------------|--------------------|------------|--------------|--------------|-------------|---------------|-------------------|--------------|---------------|-------------|
| 1 Heavy even wear on tips and corners of teeth | ● | | ● | | ● | ● | | | | | | |
| 2 Wear on both sides of teeth | | | | | | | ● | ● | | | | |
| 3 Wear on one side of teeth | | ● | | | | | ● | | | | | |
| 4 Chipped or broken teeth | | | ● | | | ● | | | | | | ● |
| 5 Discolored tips of teeth due to excessive frictional heat | ● | | | | ● | | | | | | | |
| 6 Tooth strippage | ● | | ● | ● | ● | ● | | | | | | ● |
| 7 Chips welded to tooth tips | ● | | | ● | ● | ● | | | | | | |
| 8 Gullets loading up with material | | | | ● | ● | ● | | | | | | ● |
| 9 Heavy wear on both sides of band | | | | | ● | | ● | | | | | |
| 10 Uneven wear or scoring on sides of the band | | | | | | | ● | | | | | |
| 11 Body breakage or cracks from gullets | | | | | | | ● | | ● | ● | | |
| 12 Body breakage fracture traveling in angular direction | | | | | | | ● | | ● | | | |
| 13 Body breakage or cracks from back edge | | | | | | ● | | ● | ● | ● | ● | |
| 14 Heavy wear and/or swaging on back edge | | | | | | ● | | ● | ● | | ● | |
| 15 Butt weld breakage | | | | | | ● | ● | ● | ● | ● | ● | |
| 16 Used band is "long" on the tooth edge | | ● | | | | ● | ● | | ● | | ● | |
| 17 Used band is "short" on the tooth edge | | ● | | | | ● | ● | | | | | |
| 18 Band is twisted into figure "8" configuration | | ● | | | | ● | ● | ● | ● | ● | ● | |
| 19 Broken band shows a twist in band length | | ● | | | | ● | ● | ● | ● | ● | ● | |
| 20 Heavy wear in only the smallest gullets | ● | | | | | ● | | | | | | ● |

"The information given in the table are the standard values. We ask you to contact us in case of special requests."










 +90 262 999 60 01  www.azaktool.com  info@azaktool.com

 *Organize Sanayi Bölgesi Mahallesi, 4. Cadde
No:8/1, Dilovası, Kocaeli, TÜRKİYE*

