RÖNTGEN®
GERMAN QUALITY – ENDURING PRECISION

# OUR GUIDE TO RÖNTGEN




www.roentgen-saw.com

# CERTIFICATIONS



LRQA

Current issue date: 18 December 2024
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Certificate identity number: 10643934

Original approval(s):
ISO 9001 • 28 July 1995
ISO 50001 • 26 October 2016

## Certificate of Approval

This is to certify that the Management System of:

**ROBERT RÖNTGEN GMBH & Co. KG**

Auf dem Knapp 44, 42855 Remscheid, Germany

has been approved by LRQA to the following standards:

**ISO 9001:2015, ISO 50001:2018**

Approval number(s): ISO 9001 – 0017727-001, ISO 50001 – 00011644-001

This certificate forms part of the approval identified by approval number: 0017727/ 00011644

**The scope of this approval is applicable to:**

ISO 9001:2015, ISO 50001:2018

Production and sales of band saw blades, power hacksaw blades, hand hacksaw blades, reciprocating saws and circular saw blades.

**Marta Escudero**

Regional Director, Europe

Issued by: LRQA Limited

UKAS MANAGEMENT 0007

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# AUSZEICHNUNG

Für die erfolgreiche Teilnahme
am Projekt

**ÖKOPROFIT 2020/2021**

wird die

**Robert Röntgen GmbH & Co. KG**
Standort Auf dem Knapp 44
42855 Remscheid

ausgezeichnet

Oberbürgermeister Burkhard Mast-Weisz
Stadt Remscheid

Remscheid, 27. Januar 2022

Wuppertal
Solingen
Remscheid

ÖKOPROFIT
BERGISCHES STÄDTEDREIECK

# OVERVIEW

## 1. The Röntgen company

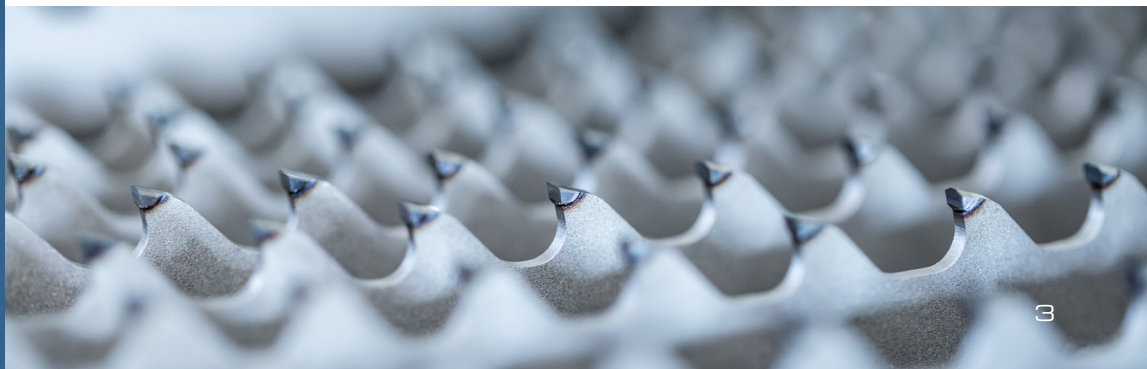
- Overview “Introducing the company”

## 2. Overview product groups – application areas

- Bi-Metal – qualities – **bi-alfa®**
- Carbide tipped – qualities – **HM-Titan**

## 3. Workshops

- Basics of sawing technology - theory
- Practical hints – “training on the job“
- Introduction to the RCS
- Causes for failure – application videos







GERMAN QUALITY –
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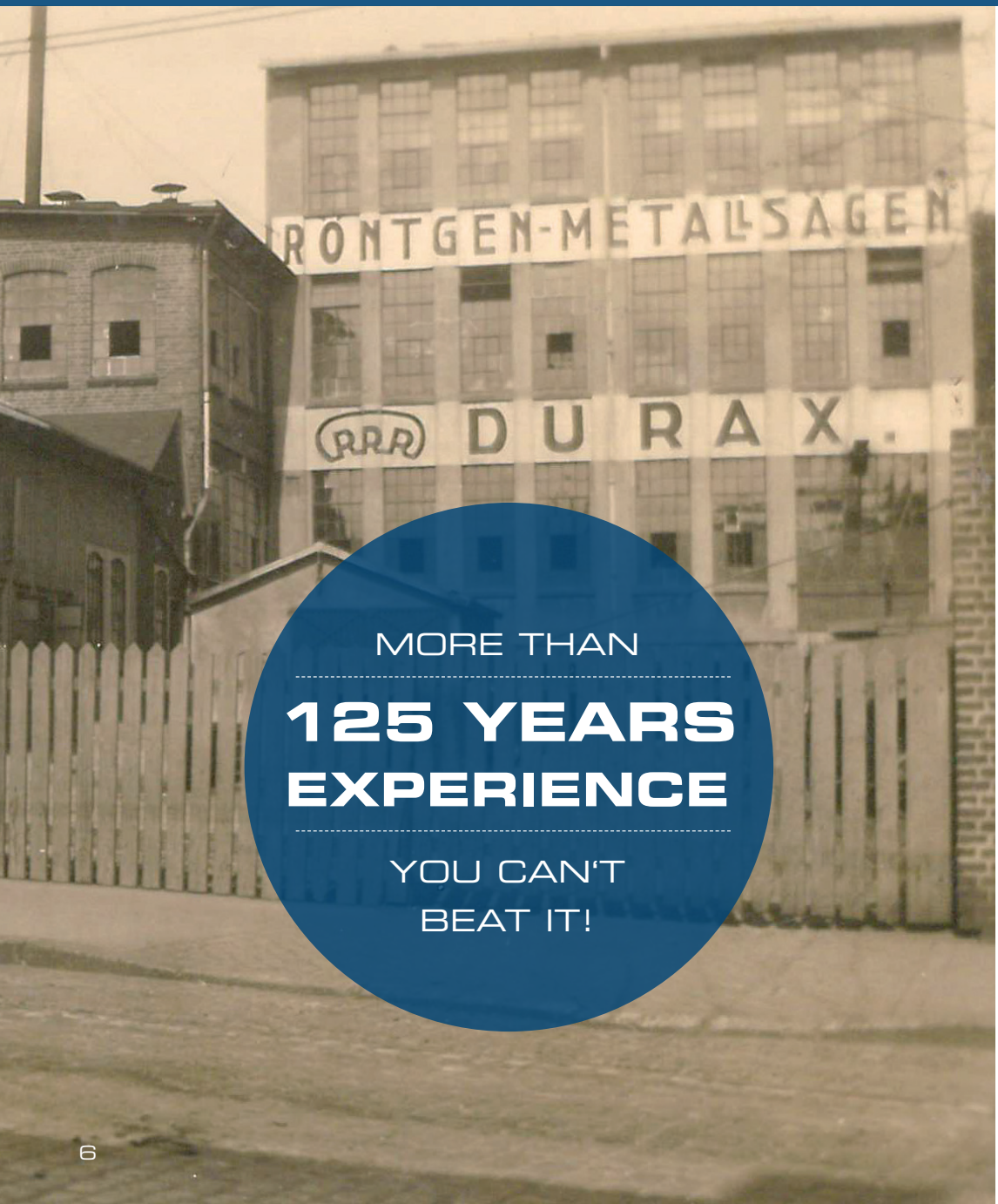
# ABOUT RÖNTGEN

RÖNTGEN®
GERMAN QUALITY - ENDURING PRECISION




Since its foundation in 1899, RÖNTGEN is known for the highest quality, technical innovations and utmost customer service. Utilising strict quality controls, constant development work in R&D and a highly precise production with state of the art machinery guarantee the precision and long blade life of RÖNTGEN BI-ALFA and HM-Titan products. Quality is of the highest priority at RÖNTGEN. The production process starts with the careful selection of raw material, followed by a precise and permanent production monitoring and ends with a thorough final inspection. Customers worldwide can rely on consistent cutting results of RÖNTGEN products.

# WE ARE
# RÖNTGEN




MORE THAN

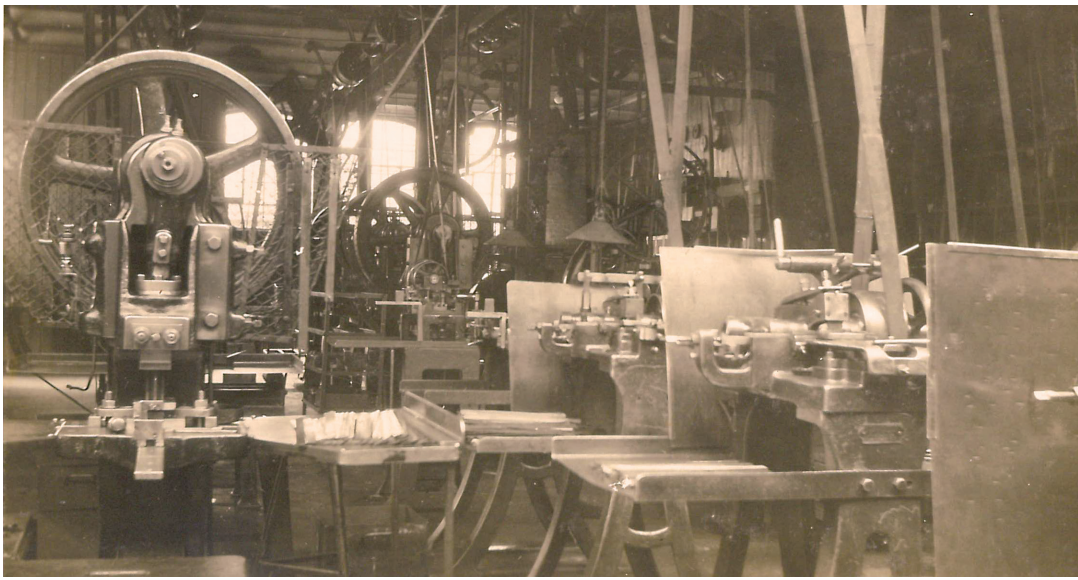
**125 YEARS EXPERIENCE**

YOU CAN'T BEAT IT!

RÖNTGEN®
GERMAN QUALITY - ENDURING PRECISION

Over 125 years of experience in the manufacture of band saw blades and saw blades and our ability to deliver the highest quality to our customers make us a global company of the absolute top class. An experienced TEAM of application engineers supports you on site, while our competent customer service ensures that everything runs smoothly.

TRUST
CUSTOMER SERVICE
EXPERIENCE
APPLICATION TECHNOLOGY
COMPETENCE
ENGINEERING
SUCCESS
SOLUTIONS



## SAFETY INSTRUCTIONS

Endless welded RÖNTGEN band saw blades are under tension when delivered. When opening the delivery form and placing the band saw blade on the sawing machine, the following safety measures must be observed:

- **wear safety glasses**
- **wear work gloves**
- **wear safety shoes**



Detailed safety instructions can be found in the operating instructions of the respective machine manufacturer or available upon request from RÖNTGEN.

# APPLICATION AREAS

- Square tube
- Plates
- Square tubes in bundles
- Bundled solids
- Thick-walled tube
- T-, I- and L-beams
- Thin-walled tube
- Back wave

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## EXPLANATION OF ICONS

Due to the variety of our band saw blades, we are able to cover a wide range of applications. The following icons indicate which band saw blade fits best to your individual cutting job.


Round tubes in bundles


Bundled angles


Profiles


Thick-walled tubes & solid bar


Small round solids


Round solids


Square solids

# OUR
# PRODUCT OVERVIEW

## M42 TOOTH TIP – THE ONE WITH PROFILE

### bi-alfa®

Profile
Profile WS

- combi tooth pitch
- the reinforced tooth back design increases the wear resistance of the tooth caused by vibrations during interrupted cuts
- most suitable for tubes, beams and profiles
- backing material made of high alloyed spring steel
- quality WS creates a larger cutting channel, which helps to prevent blade binding, specially for materials with residual stress
- innovative tooth profile for low-vibration during the sawing process

**APPLICATION AREAS**



### bi-alfa®

Profile forteC
Profile WS forteC

- combi tooth pitch
- pre-honed cutting edges
- corresponds to the specification of bi-alfa Profile/Profile WS additionally with special forteC coating to increase the cutting performance

**APPLICATION AREAS**



## bi-alfa®

### cobalt M42
### cobalt WS
### cobalt WS ALU

- constant or combi tooth pitch
- universal use, cutting of all common steel types up to a hardness of < 45 HRC
- tooth tips made of alloyed high-speed steel (HSS) M42
- backing material made of high alloyed spring steel
- quality WS creates a larger cutting channel, which helps to prevent blade binding, suitable for materials with residual stress
- also in WS ALU version for aluminium alloys > 5 % Si content

**APPLICATION AREAS**



## bi-alfa®

### cobalt forteC

- combi tooth pitch
- pre-honed cutting edges
- corresponds to the specification of bi-alfa cobalt M42 additionally with special forteC coating to increase the cutting performance

**APPLICATION AREAS**

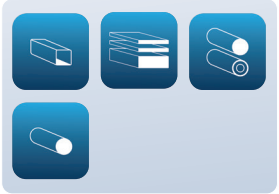


## bi-alfa®

### cobalt RP

- combi tooth pitch
- especially suitable for solid material of all common steel grades up to a hardness of < 45HRC
- aggressive cutting characteristics to cut exotic alloys and non-ferrous metals

**APPLICATION AREAS**



# M51 – FOR THE EXTRA TOOL LIFE

## M42/M51 MASTER – THE ONE WITH THE SPECIAL CUT

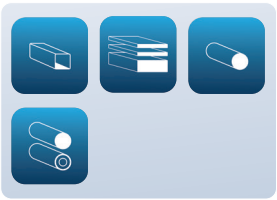
### bi-alfa®

cobalt M51

Master M51

- combi tooth pitch
- cutting of all common steel grades up to a hardness of 50 HRC
- tooth tips made of alloyed high-speed steel (HSS) M51 have a high thermal and mechanical wear resistance
- backing material made of high alloyed spring steel
- Master version with special grinding on the pre-cutter

**APPLICATION AREAS**

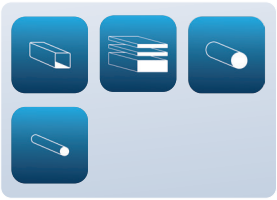


### bi-alfa®

Master

- combi tooth pitch
- especially suitable for solid material of all common steel grades up to a hardness of < 45HRC
- improved cutting guidance/performance by ground pre-cutter/ tooth height difference
- tooth tips made of alloyed high-speed steel (HSS) M42
- for cutting stainless steel, high and highest alloyed materials

**APPLICATION AREAS**



# bi-alfa®

## Master Supreme

- combi tooth pitch
- cutting of all common steel grades up to a hardness of 50 HRC
- tooth tips made of alloyed high-speed steel (HSS) M51 have a high thermal and mechanical wear resistance
- improved cutting guidance/performance by ground pre-cutter/tooth height difference
- aggressive cutting characteristics to cut exotic alloys on larger cross sections
- longer life and improved cutting surfaces with hard to cut materials

**APPLICATION AREAS**



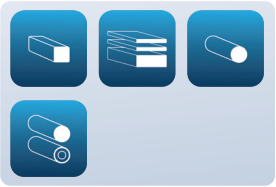

**Available with backwave technology**

# HM TITAN –
# THE NEW DIMENSION OF SAWING
## THE **COST OPTIMIZER**

## HM-Titan
### MU

- multi-chip geometry
- universal use, cutting of all common steel types up to a hardness of 1700 N/mm2
- tooth tips made of high-quality carbide
- backing material made of high alloyed spring steel
- particularly quiet and vibration free cutting with an optimized cutting surface due to precise grinding geometry

**APPLICATION AREAS**



## HM-Titan
### forteC

- multi-chip geometry for increasing cutting parameters
- increase in performance of 10-30 % with the same tool life
- pre-honed cutting edges

**APPLICATION AREAS**



## HM-Titan
### Profile
### Profile forteC

- PF-geometry
- cutting of all common steel types up to a hardness of 1900 N/mm2
- particularly suitable for thick-walled tubes/tough materials/special alloys
- Profile forteC: increase in performance of 10-30 % with the same tool life with an additional forteC-coating
- Profile forteC: pre-honed cutting edges

**APPLICATION AREAS**

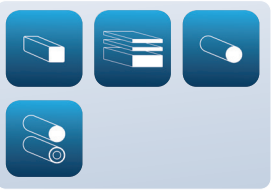


# HM-Titan

## B0
## B0 forteC

- high performance band saw blade with special geometry
- cutting of hardened/induction-hardened and extremely hard materials > 50 HRC
- B0 is also suitable for use on machines with limited performance
- performance increase with forteC coating of 10-30% at same tool life

**APPLICATION AREAS**





Excavator bucket wear tips



Cylinder shafts

# HM-Titan

## MUSN
## MUSN forteC

- high performance band saw blade with special geometry
- cutting of hardened/induction-hardened and extreme hard materials > 50 HRC
- MUSN requires the use of heavy-duty sawing machines
- multi-chip geometry for increasing cutting parameters
- performance increase with forteC coating of 10-30% at same tool life

**APPLICATION AREAS**



# HM TITAN –
# THE NEW DIMENSION OF SAWING
## THE SPECIALISTS FOR **ALU HIGH SPEED PERFORMANCE**

## HM-Titan
ALU2
ALU3

**APPLICATION AREAS**



- VN-geometry/multi-chip geometry
- tooth tips made of wear resistant special carbide
- high alloyed spring steel strip for high blade speeds and feeds
- particularly suitable for blocks, plates, sprues, risers and manual feeds
- optimized cutting surfaces for plates and block cutting applications
- optimized gullet profile for long contact lengths

## HM-Titan
Engine

**APPLICATION AREAS**



- VN-geometry
- tooth tips made of performance-oriented special carbide material
- high-alloyed spring band steel for high cutting speeds and feeds
- optimized tooth profile for silted parts
- carbide cutting material optimized for alloys with a high Si-content
- high flexible spring steel for high reversed bending stress
- developed for abrasives, high-silicon alloys
- also suitable for cutting graphite

## HM-Titan
ALU SET

**APPLICATION AREAS**



- the special set pattern causes a larger cutting channel, prevents the saw blade from binding in materials with residual stress
- high alloyed spring steel strip for high blade speeds and feeds
- particularly suitable for manual feed

# HM TITAN –
# THE NEW DIMENSION OF SAWING
## THE SPECIALISTS FOR **HIGH-TECH MATERIALS**
## WITH **THE IDEAL GAP SIZE**

## HM-Titan

FIT

FIT SET

- multi-chip geometry
- high-performance band saw blade especially for sawing difficult-to-cut materials in the following material groups: stainless steel, nickel-based alloys and titanium
- newly developed, highly wear resistant carbide body in order to increase the performance features (tool life, cutting quality, performance and cutting precision)
- multi-chip geometry
- optimization of cutting costs
- backing strip made of high-alloyed spring steel

**APPLICATION AREAS**




**Available with backwave technology**

## HM-Titan

SET

nSET

- universal use, cutting of all common steel types up to a hardness of 1700 N/mm2
- the special set pattern causes a larger cutting channel, prevents the band saw blade from binding with residual stress (i.e. Inconel, Hastelloy or forged materials)
- also suitable for powerful sawing machines and less powerful machines not specially equipped for TCT-blades
- particularly suitable for large contact lengths
- available in step set (SET) and normal set (nSET)
- high performance band saw blade with special geometry

**APPLICATION AREAS**



# HM-Titan

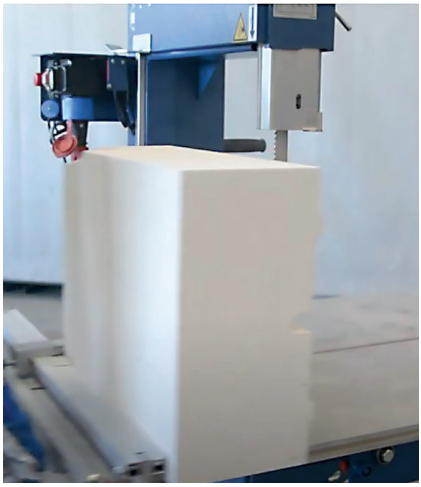
## TCO

- reduced cutting pressure, to ensure fatigue-free working with predominantly manual feed
- highly wear-resistant carbide bodies increase tool life
- for highly abrasive materials (e.g. Ytong, Poroton, perforated bricks or insulation boards)
- especially for the use in the construction industry with size 27x0.90 mm 3 tpi for band saw blade machines
  e.g. Zagro (UVB series); Lissmac (MBS series); Norton Clipper (CB series)

**APPLICATION AREAS**







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# APPLICATION & QUALITY

Continuously optimized geometries, set angles and tooth shapes, ever more precisely designed production lines with the highest degree of automation and a dense network of quality assurance measures ensure that RÖNTGEN band saw blades deliver top performance in terms of speed and service life.



# THE SAW BLADE – THE HEART OF YOUR BAND SAW MACHINE

Like a vehicle without the right wheels...without the right saw blade, your machine will come to a standstill. Therefore, a reliable supply of high-quality replacement parts is essential. While many saw blades are also used for wood or plastic, RÖNTGEN band saw blades are specially designed for precise and economical sawing of metal.

## Customized. Fast. Suitable.

We offer the optimal solution for every application. We also realize custom-made designs and specific requirements with the help of our in-house product development and application technology. Thanks to our many years of application experience and the ongoing development of our materials and processes, you always receive a high-quality product.

## QUALITY YOU CAN RELY ON

The quality of our band saw blades begins with the careful selection of materials. We use state-of-the-art manufacturing processes and precise measuring technology in our production. The result: long tool life, maximum cutting performance and impressive cost-effectiveness.

## BAND SAW BLADES DIRECTLY FROM THE MANUFACTURER

Band saw blades vary greatly depending on the area of application. As a manufacturer with our own production facilities, we can respond flexibly to your requirements – and deliver exactly what you need.



## YOUR BENEFITS AT A GLANCE

- Extensive product range of all common sizes
- Saw blades for every metal type
- Customized production on request
- Expert advice & simple processing

## HOW DO YOU FIND THE RIGHT BANDSAW BLADE?

A band saw blade is a highly complex tool. Its performance depends not only on the material and manufacturing quality, but above all on the area of application. The right choice begins with the base material – from tool steel to bi-metal to carbide. Equally important: tooth shape and geometry suitable for the application.
Whether in trade or industry: Choose consciously between an all-round solution and a specialized tool. Our product range offers a wide selection – and personal support from our experts if required. On the following pages you will find important information - here is a first tip:

**Band Saw Blades are wear parts.**
**Order them in advance.**

**By this, you will avoid unnecessary machine downtime!**

# Band saw blades – BREAK-IN PROCEDURE OF THE BAND SAW BLADE

## Why should band saw blades generally be broken in?

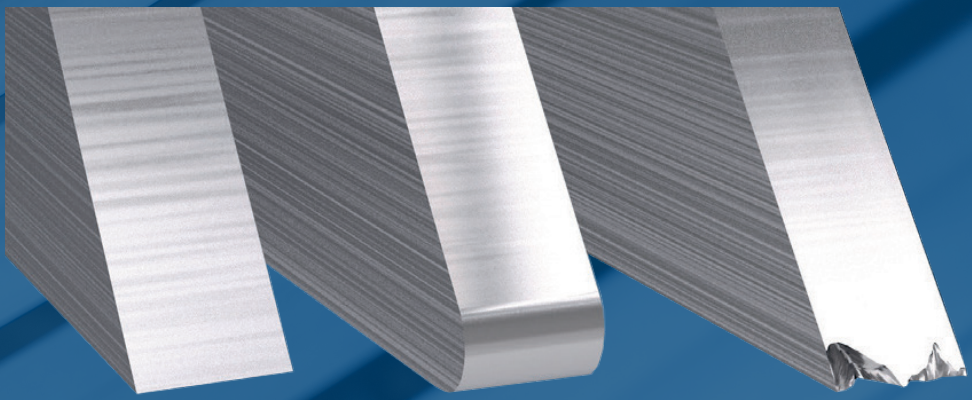
Sharp teeth are more sensitive than slightly burred and rounded teeth. New teeth do not all have the same height. Proper break-in of the band saw blade prevents the teeth from chipping and ensures even wear and a longer service life.

## How to break in a band saw blade:

Select the band speed depending on the machinability and size of the material to be cut (approx. 30% lower than the normal parameter). Reduce the feed rate by approx. 50 % of the normal parameter for 600 $cm^2$ (depending on the material).



# Overview band saw blades with break in



**NEW BAND**

- Ragged edge
- Milling/grinding burr

**WITH BREAK IN**

- Optimum insert rounding
- Sturdy, defined cutting edge

**WITHOUT BREAK IN**

- Tooth cutting edge broken out
- Undefined cutting edge

# Band saw blade guide – guide types:

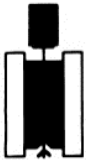
## Roller guides:

This type of guide is found on most simple bandsaw machines. The rollers must be adjusted free from clearance without play in order to guide the bandsaw blade optimally. Cheap machines often use simple ball bearings. These should be replaced with high-quality ball bearings if necessary. Ceramic elements are used in higher-quality machines and are characterised by their long service life and good sliding properties. The better the roller guide is processed and the more stable and precisely adjustable it is - the more options the machine often offers for cutting different types of material and by this the use of different band saw designs.



## Fixed guided tours:

This type is often found on older band saw machines. It is difficult to adjust blades from different manufacturers.



## Pressure guide:

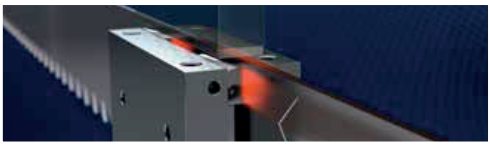
This type is often found on high-quality band saw machines. Optimum guide type that can be adjusted free from clearance without play and therefore offers optimum band run even when the band saw blade is subjected to high forces.



### WORN SIDE GUIDES

**PROBLEM:**
Too strongly adjusted or damaged side guides cause formation of microcracks and blade breakage.

**SOLUTION:**
Reduce pressure. Clean side guides.



**Video: youtu.be/22FKj4E6fAk**



# METAL band saw blades – optimisation of the tooth pitch:

Small rule of thumb for optimised tooth pitch when cutting metal with a material thickness between 50-230 mm:

| | |
|---|---|
| **Soft materials:** | **average of 17 teeth in operation** |
| **Hard materials:** | **average of 28 teeth in operation** |
| **Tough materials:** | **average of 20 teeth in operation** |

## TOOTH PITCH TOO SMALL

**PROBLEM:**
The chips are too large. The teeth gullets become full and lead to teeth stripping.

**SOLUTION:**
Select a coarser tooth pitch.



Video: youtu.be/pKp0ZSt1p6I

## TOOTH PITCH TOO COARSE

**PROBLEM:**
Teeth have no guide in the cutting channel, which causes tooth tip damage (interruptive cutting).

**SOLUTION:**
Use finer tooth pitch.



Video: youtu.be/BHsyczr09cI

## Idlers – Impellers:

The impellers play a key role in the band saw machine. The causes of problems with band saw blades can often be found here.

## Here are some useful tips:

If a flange is present, the back of the blade must not be in direct contact, otherwise the blade will be damaged.

Damaged bearings lead to uneven running and can cause damage. Defective bearings must be replaced.

The impeller must be adjusted so that the saw blade is guided correctly.

Chip or cutting residues can accumulate on the laggings and even small elevations can cause permanent point loads on the blade, which can lead to damage. It is therefore advisable to inspect the overlays at regular intervals and damaged treads should be replaced/reworked immediately.

The teeth of the band saw blade should run freely and not touch the running surface, otherwise they will be damaged (set).

**MISALIGNED IMPELLER**

**PROBLEM:**
Incorrect alignment causes burrs at the band back edge, and microcracks, result: blade break.

**SOLUTION:**
Adjust wheels. Keep a clearance between band back edge and flange of the wheels of min 0.5mm, max 1.5mm.



**Video: youtu.be/BzSw0dFMsf0**

# BASICS OF THE
# SAWING TECHNOLOGY

## Band saw blades – tooth pitch:

There are a number of factors that determine the correct tooth pitch. Years of experience and knowledge of your own machine will lead to the best results. However, those who do not yet have their own wealth of experience to fall back on often have major problems at the beginning with inaccurate, uneven and unclean cuts, as well as short tool lives.

We have therefore briefly summarized the most important points for use on a metal band saw.

If you have any further questions, your contact person in the customer service and our application engineers will be happy to help you with your selection.

### Selection criteria:

1. Target: at least 3 teeth in operation. Exceptions: combined toothing.

2. Too many teeth in the cut cause heating and reduce the life of the band saw blade. Chip space too small. Saw blade “bounces“, teeth tear off.



3. A low number of teeth and a larger chip space are required for soft materials.

4. Harder materials require more teeth to distribute the work and create a smaller chip space.

5. Machine performance and condition. It is better to increase the number of teeth and reduce the load on the machine.

6. If there are many users and different tasks, use band saw blades with combined toothing to avoid operating errors.

7. Other band saw blades that are used.

8. The range of materials.

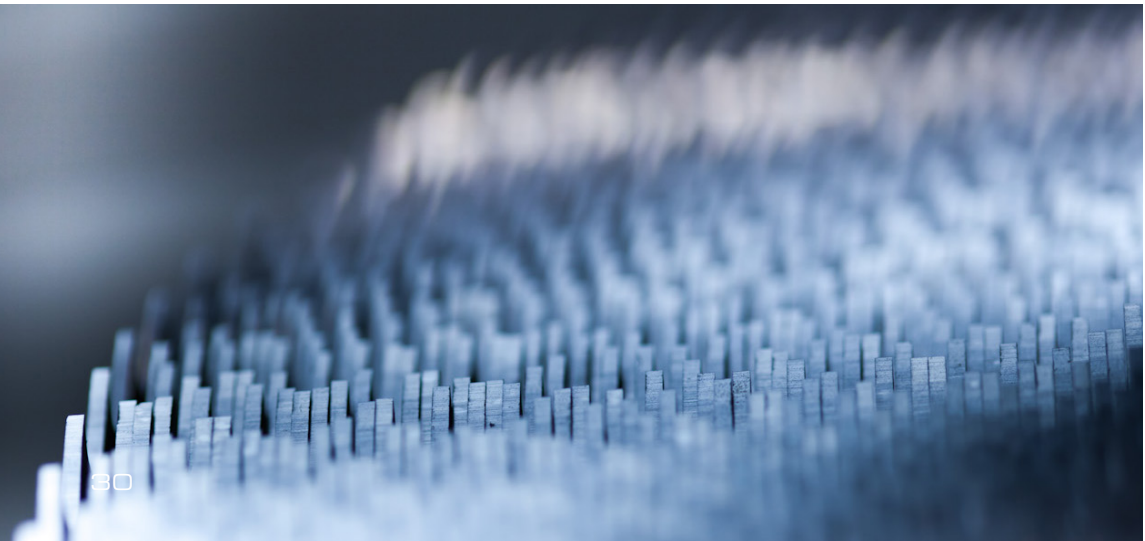
9. Required production output and tool life.

10. The desired surface finish. The more teeth, the cleaner the cutting edges and surface.

# Bandsaw blades – problems with chipped teeth:

A too high penetration depth (cutting pressure) is the problem in most cases when teeth break out. All points where a too high penetration depth is the cause are marked with an (E).

1. (E) Number of teeth in operation too low.
2. Number of teeth too high in operation.
3. If the number of teeth in the cut is too high, the head will “bounce“ on small machines and block the chip space on larger machines.
4. (E) Components not firmly clamped.



5 (E) Excessive penetration depth due to low blade speed.

6 (E) Welding seam offset or not aligned.

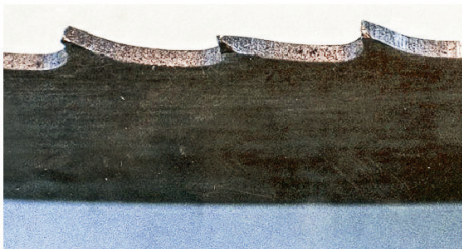
7 (E) Excessive penetration depth due to too high feed.

8 (E) Low blade tension causes blade slippage.

9 (E) Excessive penetration depth due to uneven hydraulic feed.

10 (E) Excessive penetration depth due to blade slippage under load.

11 Chip brushes on the production machine do not work.



**WORN BRUSHES**

**PROBLEM:**
Worn or incorrectly adjusted brushes are reducing the life ofthe saw blade

**SOLUTION:**
Adjust brushes regularly and replace when worn.



**Video: youtu.be/VOjo09JY4Pk**

# Band saw blades – problems with cracks in the chip space:

1. Idlers too small in relation to blade thickness.
2. Worn bearings of the impellers or guides.
3. Distance between blade and back guides too large.
4. The side guides grind against the chip space area.
5. Loose side guides cause the blade to skew.
6. Guide arms too far apart.
7. Incorrect blade tension.
8. Tooth pitch too coarse.



# Band saw blades – Cracks on the body back:

1. Worn back guides harden the back of the blade. (Formation of friction martensite due to temperature influence)
2. Also worn side guides.
3. The back of the blade is too close to the impeller flange.

### BURR ON BODY BACK

**PROBLEM:**
a) No clearance between body back and flange of the wheels.
b) Worn back guides.

**SOLUTION:**
a) Adjust wheels.
b) Replace back guides.



Video: youtu.be/P9_6Z2S8qZw

### BODY CRACK ON BODY BACK

**PROBLEM:**
Body cracks caused by worn back guides. Leading to the back edge of the blade becoming brittle.

**SOLUTION:**
Replace back guides



Video: youtu.be/WKAUZm52GAs

# THE USE OF BAND SAW BLADES / TOOL LIFE / PERFORMANCE / CUTTING AREA OF A BAND SAW BLADE IS DEPENDING ON:

1. the correct tooth pitch.
2. the correct cutting data.
3. the condition of the band saw machine.

## THE TOOTH PITCH

As a rule:
A too fine tooth pitch leads to cutting deviations/cooked cuts up to band breakage. The too small gullets cannot take the chips.

A too coarse tooth pitch leads to the breakage of tooth tips. The single tooth tip is being overloaded. The result is chopping and tearing, not sawing.

## Determining the correct tooth pitch

For round solids materials the diameter is decisive.
For tubes and profiles the longest contact length is decisive.
**Guideline: “As coarse as necessary, but as fine as possible“.**




Chart tooth pitch recommendation for solid material for product group RÖNTGEN bi-metal band saw blades.

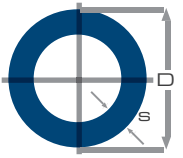
| Combi tooth pitch | |
|---|---|
| **Material cross-section** | **Tooth pitch** |
| <25 mm | 10/14 ZpZ |
| 15 - 40 mm | 8/12 ZpZ |
| 25 - 50 mm | 6/10 ZpZ |
| 35 - 70 mm | 5/8 ZpZ |
| 40 - 90 mm | 5/6 ZpZ |
| 50 - 120 mm | 4/6 ZpZ* |
| 80 - 180 mm | 3/4 ZpZ* |
| 130 - 350 mm | 2/3 ZpZ |
| 150 - 450 mm | 1,5/2 ZpZ |
| 200 - 600 mm | 1,1/1,6 ZpZ |
| > 500 mm | 0,75/1,25 ZpZ |

* Alternatively you can choose tooth pitch 4/5 combi.

| Röntgen HM Titan | |
|---|---|
| **Material cross-section** | **Tooth pitch** |
| 50 - 120 mm | 3/4 ZpZ |
| 100 - 250 mm | 2/3 ZpZ |
| 150 - 400 mm | 1,5/2 ZpZ |
| 350 - 600 mm | 1,1/1,6 ZpZ |
| > 500 mm | 0,85/1,15 ZpZ |

Chart tooth pitch recommendation for solid material for product group RÖNTGEN carbide tipped bandsaw blades.

Chart tooth pitch recommendation for tubes for RÖNTGEN bi-metal band saw blades, without product group RÖNTGEN bi-alfa Profile.




| Wall thickness S (mm) | Outer pipe diameter D (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 40 | 60 | 80 | 100 | 120 | 150 | 200 | 300 | 500 |
| 2 | 14 | 10/14 P | 10/14 P | 10/14P | 10/14 P | 8/12 P | 8/12 P | 8/12 P | 8/12 P | 5/8 P |
| 3 | 14 | 10/14 P | 10/14 P | 8/12 P | 8/12 P | 8/12 P | 8/12 P | 6/10 P | 6/10 P | 5/8 P |
| 4 | 10/14 P | 10/14 P | 8/12 P | 8/12 P | 8/12 P | 6/10 P | 6/10 P | 5/8 P | 5/8 P | 4/6 P |
| 5 | 10/14 P | 10/14 P | 8/12 P | 8/12 P | 6/10 P | 6/10 P | 5/8 P | 4/6 P | 4/6 P | 4/6 P |
| 6 | 10/14 P | 8/12 P | 8/12 P | 6/10 P | 6/10 P | 5/8 P | 5/8 P | 4/6 P | 4/6 P | 4/6 P |
| 8 | 10/14 P | 8/12 P | 8/12 P | 6/10 P | 5/8 P | 5/8 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P |
| 10 | | 8/12 P | 6/10 P | 5/8 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/5 P |
| 12 | | 8/12 P | 6/10 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/5 P |
| 15 | | 8/12 P | 6/10 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/5 P | 4/5 P | 4/5 P |
| 20 | | | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/5 P | 4/5 P | 4/5 P | 3/4 P |
| 30 | | | | 4/6 P | 4/6 P | 4/5 P | 4/5 P | 4/5 P | 4/5 P | 2/3 P |
| 50 | | | | | | | 4/5 P | 3/4 P | 2/3 P | 2/3 P |
| 80 | | | | | | | | 3/4 P | 2/3 P | 2/3 P |
| >100 | | | | | | | | | 2/3 P | 1,5/2 |

Chart tooth pitch recommendation for tubes for product group RÖNTGEN bi-alfa Profile.

| Wall thickness S (mm) | Outer pipe diameter D (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 20 | 40 | 60 | 80 | 100 | 120 | 150 | 200 | 300 |
| 2 | 12/16 P | 12/16 P | 12/16 P | 12/16 P | 12/16 P | 8/11 P | 8/11 P | 8/11 P | 8/11 P |
| 3 | 12/16 P | 12/16 P | 12/16 P | 8/11 P | 8/11 P | 8/11 P | 8/11 P | 5/7 P | 5/7 P |
| 4 | 12/16 P | 12/16 P | 8/11 P | 8/11 P | 8/11 P | 5/7 P | 5/7 P | 5/7 P | 5/7 P |
| 5 | 12/16 P | 12/16 P | 8/11 P | 8/11 P | 5/7 P | 5/7 P | 5/7 P | 4/6 P | 4/6 P |
| 6 | 12/16 P | 8/11 P | 8/11 P | 5/7 P | 5/7 P | 5/7 P | 5/7 P | 4/6 P | 4/6 P |
| 8 | 8/11 P | 8/11 P | 8/11 P | 5/7 P | 5/7 P | 5/7 P | 4/6 P | 4/6 P | 4/6 P |
| 10 | | 8/11 P | 5/7 P | 5/7 P | 5/7 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P |
| 12 | | 8/11 P | 5/7 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P |
| 15 | | 8/11 P | 5/7 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 4/6 P | 3/4 P |

## Cutting speed

The cutting speed should match with the machinability of the material. Also the tensile strength/hardness of the material (soft annealed, hardened and tempered) should be considered.

## Feed

With simple band sawing machines, the saw beam is lowered manually by means of a hand lever. The result depends on the machine operator. The band saw blade should work continuously and produce loosely rolled chips. A time per section (t in min.) can be calculated/preset. Compliance depends on the experience of the machine operator. Usually a chart is attached to the machine showing the recommended tooth pitch (according to cross section) and cutting speed (according to material quality).
On band saw machines with hydraulic feed the feed rate is also indicated. Either as a value in mm/min or as value for the scale of the feed valve.

# RÖNTGEN CUTTING SOLUTION

RÖNTGEN
CUTTING
SOLUTION

The cutting data program recommends for the entered sawing job:

- the optimum cutting speed
- the correct feed rate
- the most suitable RÖNTGEN band saw blade quality
- calculation of alternative, potentially reduced parameters for a “suboptimal“ RÖNTGEN saw blade available on-site (bimetal and carbide alternatives)

The aim is to achieve a long tool life/performance and a high cutting quality.

## Excerpt from the recommendation

| | Bi-Metall | Carbide tipped |
|---|---|---|
| **Product recommendation** | | |
| Band saw blade quality: | Master Supreme | HM-Titan forteC |
| Röntgen-article group: | 700780 | 800400 |
| Band saw blade dimension: | 6830 x 41 x 1,3 mm | 6830 x 41 x 1,3 mm |
| Toothing (tooth pitch) [ZpZ]: | 2/3 | 2/3 |
| **Cutting data recommendation** | | |
| Cutting speed Vc [m/min]: | 32 | 75 |
| Cutting performance Vz [cm²/min]: | 27 | 56 |
| Feed rate Vf [mm/min]: | 17,0 | 35,5 |
| Cutting time [min]: | 11,8 | 5,6 |
| Cooling lubricant [% Fett]: | 12-15 | 12-15 |



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