

*Since 2013*



# HIGH PERFORMANCE METAL CUTTING CIRCULAR SAW BLADES

Market Leader In Saws





## *Company Profile*

Founded in 2013 and located at capital city of India (Delhi), MI tools is the first Indian company to register brand in HSS circular saw blade, having equivalent quality compared to European brands at reasonable cost.

We provide following cost effective solution for the industries for cutting and shaping for metal cutting application:-

- HSS Circular Saw Blades
- TCT Circular Saw Blades
- Cermet Tip Circular Saw Blades
- Hot Saw Blades
- Friction Saw Blades
- Bi-Metal Band Saw Blades
- Circular Knives

**Note:** *We also provide customised tools as per requirement of the customer for special production needs*

The constant policy of the company throughout over 10 years of experience in the field of circular saws have realized our highly qualified technical team to develop more awareness to customers in having correct selection of circular saw blades.

### **Our Sales & Service Network**

Our PAN India offices and partner are currently working in 15-20 major cities across countries to ensure extensive services and distribution network.

### **Our other brands and products**

- MI TCT Circular Blades for wood industry
- MI Router Bits
- MI Knives for cutter heads
- MI Machines for Wood and Metal Industry

## HSS-DMo5 / Co5% CIRCULAR SAW BLADES

### Raw materials

#### HSS/DMo5 - AISI M2 - DIN 1.3343

##### HIGH SPEED STEEL WITH TUNGSTEN-MOLYBDENUM

These elements contain high mechanical characteristics maintaining an excellent toughness.

Molybdenum (Mo), present in 5%, reduces notably the brittleness, favors the formation of a very fine martensitic grain, increases the limit of fatigue and consequently the mechanical resistance, obtaining an improvement of the cutting characteristics.

Tungsten (W), present in 6,4%, produces hard carbides; it contributes to improve the blade toughness preventing the grain growth. It increases the tensile strength and above all the wear resistance to the high working temperatures, improving cutting performances. Vanadium is also present (V) in 1,9%, which makes the grain thinner allowing the formation of hard carbides that improve the wear resistance.

##### CHEMICAL COMPOSITION

C %	Cr %	Mo %	W %	Co %	V %
0,90	4,2	5,0	6,4	-	1,9

#### HSS/Co5% - AISI M35 - DIN 1.3243

##### HIGH SPEED STEEL WITH TUNGSTEN-MOLYBDENUM AND COBALT

Different from DMo5 due to higher cobalt presence (5%).

Cobalt (Co) is an element that reduces the grain growth at high temperatures, so the presence of this element gives to the steel a high seal cutting and hardness.

This steel grade is fundamental when they have to cut materials such as stainless steel or with high mechanical resistance, that generate high temperatures at the contact point.

##### CHEMICAL COMPOSITION

C %	Cr %	Mo %	W %	Co %	V %
0,93	4,2	5,0	6,4	4,8	1,9

All used steels are accompanied with conformity certificate issued by steel plants certified ISO 9000.



## HSS-DMo5 / Co5% CIRCULAR SAW BLADES

### Surface treatments

#### PVD system

Our saw blades can be supplied bright finish or steam oxide treated or P.V.D. coated. **PVD system** covers high speed steel blades without altering their structural characteristics, because the coating process is made at lower temperatures than the one used during tempering. Normally the deposited layer is between 2 and 5 microns, important in this phase of coating is the thermal expansion coefficient, the thermal conductivity, the hardness, the thermodynamic stability to elevated temperatures; because from these elements depend the final result.

##### COATING FEATURES

- surface hardness increase
- friction reduction and reduction of thermal conductivity
- reduction of working time/machine stops
- reduction of the formation of the edge of amount carried over
- limitation of corrosion and oxidation phenomenons



#### Steam Oxide treatment

This is a controlled oxidation on the blade that makes a layer of iron oxide which increases the self-lubricating capacity and the antifriction of the saw blade giving the following advantages:

- Increased ability to retain the coolant and therefore greater heat dissipation during the cutting.
- High resistance the glue, thus reducing the possibility of seizure.
- Reduction of friction coefficients with increasing of the performances.

**Recommended blade on manual cut-off machine.**

##### COATING FEATURES

- Surface hardness: 900 HV
- Friction coefficient: 0,60



## HSS-DMo5 / Co5% CIRCULAR SAW BLADES

### PVD coatings

#### **TiN** • Titanium nitride coating

This coating gives to the blade an high surface hardness and it is particularly suitable for cutting medium/low alloy steel and in conditions of cutting involving hard wearing both adhesive and abrasive type. Thanks to this kind of coating is possible to obtain various advantages and improvements in processing such as a reduction of the effect of cold welding between the tool and the workpiece material, a reduction of friction, a reduction of cutting and deformation strenghts, reduction of roughness on machined parts, a better sliding of material being processed and not least an increased yield of the tool through increased feeds and greater life of the blade which may be higher 50% compared to the conventional blades

##### COATING FEATURES

**Colour** • Yellow gold

**Hardness** • 2400 Vickers (HV 0,05)

**Max Oxidation Temperature** • 640 °C

**Tenaciousness** • Quite high

**Resistance** • High to adhesive and abrasive hardwearing

**Adhesion** • High to the surface of the machine tool

**Thickness of the Coating** • 3 micron

**Steel friction coefficient** • 0,50



TiN

#### **TiCn** • Titanium carbon nitride

This coating has a very low coefficient of friction and so guarantees an excellent cut finish avoiding chipping at the cutting edge working at high parameters of cutting speed and feeds. This coating is particularly suitable for cutting highly abrasive materials such as stainless steels and medium-alloy steels or aluminum alloys, copper, brass and titanium. The high surface hardness allows high cutting speeds and feeds more than 100% compared to the traditional blades.

##### COATING FEATURES

**Colour** • Grey-violet

**Hardness** • 3000 Vickers (HV 0,05)

**Max Oxidation Temperature** • 400 °C

**Tenaciousness** • High

**Resistance** • High to adhesive and abrasive hardwearing

**Adhesion** • High to the surface of the machine tool

**Thickness of the Coating** • From 2,5 to 3 micron

**Steel friction coefficient** • 0,25



TiCn

## HSS-DMo5 / Co5% CIRCULAR SAW BLADES

### PVD coatings

#### Red Baron

This coating is a particular evolution of the TiCN coating. It is obtained by a deposit of titanium carbonitride with the addition of acetylene. This combination gives to the blade a very low coefficient of friction combined with a very high hardness of the blade which ensures high performance with an excellent cut finishing even at high cutting parameters. It is particularly suitable for cutting carbon steel, stainless steel, high alloy steels as well as for cutting titanium, copper, bronze, brass and aluminium.

##### COATING FEATURES

**Colour** • Red-orange

**Hardness** • 3200 Vickers (HV 0,05)

**Max Oxidation Temperature** • 480 °C

**Tenaciousness** • High

**Resistance** • High to adhesive and abrasive hardwearing

**Adhesion** • High to the surface of the machine tool

**Thickness of the Coating** • From 2,5 to 3 micron

**Steel friction coefficient** • 0,20



Red Baron

#### TiAlN • Titanium aluminium nitride

This coating is specifically used for cutting applications of high alloy steels, stainless steels, very hard steels and abrasive materials such as cast iron, alloys of silicon-aluminum, brass, copper, nickel and titanium. The low coefficient of friction allows the circular saws to be used with excellent results even in conditions of poor lubrication or misting. It is also particularly suitable for applications with high cutting speed, as it is able to protect the blades from high temperatures (above 400 °C) caused by high speed cutting or by high hardness of the material to be cut. Its low thermal conductivity makes it the best coating for high temperatures.

##### COATING FEATURES

**Colour** • Dark violet-black

**Hardness** • 3400 Vickers (HV 0,05)

**Max Oxidation Temperature** • 800 °C

**Tenaciousness** • Good at high temperatures

**Resistance** • High to adhesive and abrasive hardwearing

**Adhesion** • Discrete to the surface of the machine tool

**Thickness of the Coating** • 3 micron

**Steel friction coefficient** • 0,45



TiAlN

#### S-TiAlN

This PVD coating is a new concept that represents an evolution of the classic TiAlN. The coating is grey coloured and the coating thickness is 2,5 microns which gives the circular blade a hardness of 3600 Vickers (HV 0,05). This coating compared to TiAlN resists better at high temperatures and it is recommended for cutting of high alloy steels, stainless steels and very hard with high cutting speeds.

The coefficient of friction of this coating is equal to 0,45 and allows the use of circular saws in conditions of low lubrication or of micro-nebulization but also in case of cutting applications with plenty of cooling.

##### COATING FEATURES

**Colour** • Grey

**Hardness** • 3600 Vickers (HV 0,05)

**Max Oxidation Temperature** • 800 °C

**Tenaciousness** • High at high temperatures

**Resistance** • High to adhesive and abrasive hardwearing

**Adhesion** • Discrete to the surface of the machine tool

**Thickness of the Coating** • 2,5 micron

**Steel friction coefficient** • 0,45

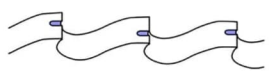


S-TiAlN



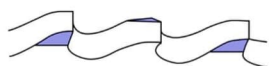
## HSS-DMo5 / Co5% CIRCULAR SAW BLADES

### Tooth form



**BR – Chip breaker**

BR Tooth form with chip breaker is normally used for tubes and profiles cutting, especially together with PVD coatings because it guarantees an excellent surface finish and an higher number of cuts.



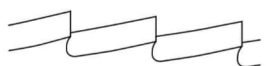
**BW**

Tooth form BW is mainly used for cutting of pipes and profiles with thin walls. BW teeth are alternatively bevelled and the bevel represents 1/3 of the blade thickness.



**HZ**

Tooth form HZ, also known as tooth form C, is normally used for bars and solid materials or thick pipes. It consists of one pre-cutting tooth with chamfer and one finishing tooth without chamfer. The pre-cutting tooth is normally 0,2-0,3 mm higher compared with the finishing tooth.



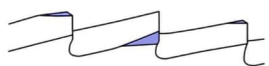
**A**

A Tooth form is normally used for jewellery and screw slotting with very fine toothing and on DIN slitting saws.



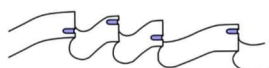
**B**

Tooth form B is mostly used for light and very thin pipes and profiles, where it is not necessary to break the chip to evacuate the tooth groove.



**AW**

Tooth form AW is normally used for precision mechanical applications with very fine teeth, especially on DIN slitting saws. AW teeth are alternatively bevelled and bevel represents 1/3 of the blade thickness.



**VP**

Tooth form VP presents a variable pitch and is applicable only on teeth with chip breaker. It presents some advantages on sections with different thicknesses and where vibrations are normally generated.



# HSS-DMo5 / Co5% CIRCULAR SAW BLADES

## Standard sizes and toothing

			Pitch, tooth form and number of teeth															
Dimensions mm	Centre bore mm	Hub mm	T 1,5 A	T 2,5 A-Bw	T 3 Bw	T 4 Bw	T 4,5 Bw	T 5 C	T 5,5 C	T 6 C	T 7 C	T 8 C	T 9 C	T 10 C	T 12 C	T 14 C	T 16 C	T 18 C
			Corresponding number of teeth															
175 x 1.2	32	75	360	220	180	140	120	110	100	90	80	70	60					
175 x 1.5	32	75	360	220	180	140	120	110	100	90	80	70	60					
175 x 2.0	32	75	360	220	180	140	120	110	100	90	80	70	60					
200 x 1.0	32	100	420	250	200	160	140	130	120	100	90	80	70	60				
200 x 1.2	32	100	420	250	200	160	140	130	120	100	90	80	70	60				
200 x 1.5/1.6	32	90	420	250	200	160	140	130	120	100	90	80	70	60				
	32	90	420	250	200	160	140	130	120	100	90	80	70	60				
200 x 1.8	32	90	420	250	200	160	140	130	120	100	90	80	70	60				
200 x 2.0	25.4/32	90	420	250	200	160	140	130	120	100	90	80	70	60				
200 x 2.5	32	90	420	250	200	160	140	130	120	100	90	80	70	60				
210 x 2.0	32	90	440	260	210	160	144	130	120	110	94	80	74	66				
225 x 1.2	32	100	470	280	220	180	160	140	128	120	100	90	80	70	60			
225 x 1.5/1.6	32	90	470	280	220	180	160	140	128	120	100	90	80	70	60			
	32/40	90	470	280	220	180	160	140	128	120	100	90	80	70	60			
225 x 1.8	32/40	90	470	280	220	180	160	140	128	120	100	90	80	70	60			
225 x 1.9/2.0	32/40	90	470	280	220	180	160	140	128	120	100	90	80	70	60			
	32/40	90	470	320	220	180	160	140	128	120	100	90	80	70	60			
250 x 1.0	32	100	520	320	250	200	180	160	140	128	110	100	90	80	66			
250 x 1.2	25.4/32	100	520	320	250	200	180	160	140	128	110	100	90	80	66			
250 x 1.5/1.6	32	100	520	320	250	200	180	160	140	128	110	100	90	80	66			
	25.4/32/40	100	520	320	250	200	180	160	140	128	110	100	90	80	66			
250 x 2.0	25.4/32/40	100	520	320	250	200	180	160	140	128	110	100	90	80	66			
250 x 2.5	25.4/32/40	100	520	320	250	200	180	160	140	128	110	100	90	80	66			
250 x 3.0	32/40	100	520	320	250	200	180	160	140	128	110	100	90	80	66			
275 x 1.2	32	100	340	280	220	200	180	160	140	120	110	96	90	70	60			
275 x 1.6	32/40	100	340	280	220	200	180	160	140	120	110	96	90	70	60			
275 x 2.0	32/40	100	340	280	220	200	180	160	140	120	110	96	90	70	60			
275 x 2.5	25.4/32/40	100	340	280	220	200	180	160	140	120	110	96	90	70	60			
275 x 3.0	32/40	100	340	280	220	200	180	160	140	120	110	96	90	70	60			
300 x 1.6	32/40	100	380	300	220	210	180	170	160	140	120	104	90	80	68			
300 x 2.0	32/40	100	380	300	220	210	180	170	160	140	120	104	90	80	68			
300 x 2.5	32/38/40	100	380	300	220	210	180	170	160	140	120	104	90	80	68			
300 x 3.0	32/40	100	380	300	220	210	180	170	160	140	120	104	90	80	68			
315 x 1.6	32/40	100	400	300	240	220	200	180	160	140	120	110	100	80	70	60		
315 x 1.8	32/40	100	400	300	240	220	200	180	160	140	120	110	100	80	70	60		
315 x 2.0	32/40	100	400	300	240	220	200	180	160	140	120	110	100	80	70	60		
315 x 2.5	32/40	100	400	300	240	220	200	180	160	140	120	110	100	80	70	60		
315 x 3.0	32/40	100	400	300	240	220	200	180	160	140	120	110	100	80	70	60		
315 x 3.5	32/40	100	400	300	240	220	200	180	160	140	120	110	100	80	70	60		
325 x 2.0	32/40	120	410	320	250	220	200	190	170	150	128	110	100	80	72	64		
325 x 2.5	32/40	120	410	320	250	220	200	190	170	150	128	110	100	80	72	64		
325 x 3.0	40	120	410	320	250	220	200	190	170	150	128	110	100	80	72	64		
350 x 1.8	32/40/50	120	440	350	280	240	220	200	180	160	140	120	110	90	80	70	60	
350 x 2.0	32/40/50	120	440	350	280	240	220	200	180	160	140	120	110	90	80	70	60	
350 x 2.5	32/40/50	120	440	350	280	240	220	200	180	160	140	120	110	90	80	70	60	
350 x 3.0	32/40/50	120	440	350	280	240	220	200	180	160	140	120	110	90	80	70	60	
350 x 3.5	32/40/50	120	440	350	280	240	220	200	180	160	140	120	110	90	80	70	60	
370 x 2.5	32/40/50	120	380	280	260	220	210	190	160	140	120	110	96	80	70	64		
370 x 3.0	32/40/50	120	380	280	260	220	210	190	160	140	120	110	96	80	70	64		
370 x 3.5	40	120	380	280	260	220	210	190	160	140	120	110	96	80	70	64		
400 x 2.2	40/50	130 x 2.5	310	280	250	230	200	180	160	140	120	100	90	80	70			
400 x 2.5	32/40/50	120	310	280	250	230	200	180	160	140	120	100	90	80	70			
400 x 3.0	32/40/50	120	310	280	250	230	200	180	160	140	120	100	90	80	70			
400 x 3.5	40/50	120	310	280	250	230	200	180	160	140	120	100	90	80	70			
400 x 4.0	50	120	310	280	250	230	200	180	160	140	120	100	90	80	70			
425 x 2.5	40/50	120	320	300	260	240	220	190	160	150	130	110	96	84	70			
425 x 3.0	40/50	120	320	300	260	240	220	190	160	150	130	110	96	84	70			
425 x 3.5	40/50	120	320	300	260	240	220	190	160	150	130	110	96	84	70			
425 x 4.0	50	120	320	300	260	240	220	190	160	150	130	110	96	84	70			
450 x 2.5	40/50	130	350	320	280	260	230	200	180	160	140	120	100	90	80			
450 x 3.0	40/50	130	350	320	280	260	230	200	180	160	140	120	100	90	80			
450 x 3.5	40/50	130	350	320	280	260	230	200	180	160	140	120	100	90	80			
450 x 4.0	40/50	130	350	320	280	260	230	200	180	160	140	120	100	90	80			
500 x 3.0	40/50	130	380	350	310	280	260	220	200	170	160	130	110	100	90			
500 x 3.5	40/50	130	380	350	310	280	260	220	200	170	160	130	110	100	90			
500 x 4.0	40/50	130	380	350	310	280	260	220	200	170	160	130	110	100	90			
500 x 5.0	40/50	130	380	350	310	280	260	220	200	170	160	130	110	100	90			
525 x 3.5	50	140	410	360	330	300	270	230	210	180	164	130	110	104	90			
525 x 4.0	50	140	410	360	330	300	270	230	210	180	164	130	110	104	90			
550 x 3.5	50/90/140	140/200/225	430	380	340	310	280	250	220	190	170	140	120	110	90			
550 x 4.0	50/90/140	140/200/225	430	380	340	310	280	250	2									

# CARBIDE AND CERMET CIRCULAR SAW BLADES FOR METAL CUTTING

## Tubes and profiles cutting

### Static cutting

*Throw-away Carbide circular saw blade, coated with PVD system, suitable for pipes and profiles cutting on static cut-off machines.*

### Carbide

Diameter mm	S1/S2	Centre bore mm	Z
250	2,0/1,70	32/40	100 - 120
285	2,0/1,75	32/40	100 - 120
315	2,5/2,25	32/40/50	100 - 110 - 120
350	2,6/2,25	32/40/50	100 - 120 - 140
400	2,6/2,25	50	100 - 120 - 140
450	2,7/2,25	50	120 - 140 - 160

### Carbide

Diameter mm	S1/S2	Centre bore mm	Z
315	3,5/2,7	50	50 - 60 - 70 - 80 - 90
355	2,9/2,3	45/80	60 - 70 - 80 - 90 - 100
360	3,8/3,0	50	50 - 60 - 70 - 80 - 100
380	3,8/3,0	115	60 - 70 - 80 - 90 - 100

### Orbital cutting

*Re-sharpenable Carbide circular saw blade, coated with PVD system, suitable for pipes and profiles cutting on orbital cut-off machines.*

### Flying cutting

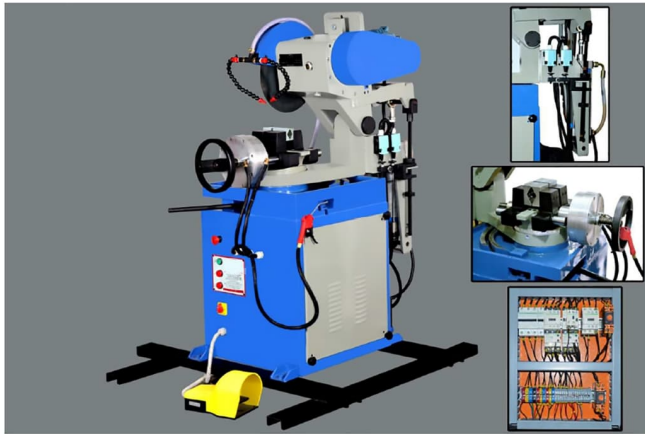
*Throw-away Carbide circular saw blade, coated with PVD system, suitable for pipes and profiles cutting on flying cut-off machines.*

### Carbide

Diameter mm	S1/S2	Centre bore mm	Z
400	2,9/2,5	50	100 - 120 - 130 - 140
450	2,9/2,5	50	100 - 120 - 130 - 140 - 160
500	3,5/3,0	50/80/90	120 - 130 - 140 - 160 - 170
550	3,8/3,3	80/90/140	120 - 140 - 150 - 160 - 170
560	3,8/3,3	80/90/140	120 - 140 - 150 - 160 - 170
600	3,8/3,3	80/90/140	140 - 150 - 160 - 170 - 180
630	3,8/3,3	80	110 - 130 - 160
650	3,8/3,3	80	120 - 150 - 170
690	3,8/3,3	50/80	140 - 150 - 170



## *MI Machine & Sharpening Centre*



**Semi-Automatic Pipe Cutting Machine**

**Semi Automatic HSS Grinding Machine**



**Hydraulic Controlled HSS/TCT Grinding Machine**



**Automatic HSS Grinding Machine**



**CNC Controlled TCT Grinding Machine**

# **Metal Cutting Circular Saws**

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