Colour Band

Drills and Taps

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Colour Band Application Drills and Taps

Bordo's Colour Band Application range of drills and taps is specially designed to optimise your machining performance. The need for greater productivity from high-performance machines, and the need to minimise down-time demands cutting tools that perform at optimal efficiency.

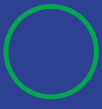
The CBA family consists of five "Colour Band Application" ranges of drill and tap combinations. Each range has been designed with different cutting geometries and surface treatments to ensure optimum tool life, machining speed and surface finish for each specific material category. Each range has its own drill and tap combination, and taps are available in both Spiral Point and Spiral Flute (roll form is also available in Yellow Band).

Stainless Steel
Blue Band

High Tensile Steel
Red Band

Aluminium
Yellow Band

Cast Iron
White Band



Carbon Steel
Green Band

Stainless Steel
Blue Band

The machining of stainless steels is difficult due to their work hardening properties, toughness and poor thermal conductivity, which places high demands on the cutting tools. The Blue Band Series has been specifically designed to suit these difficult machining requirements. TiAlN coating increases tool surface hardness to 87Rc. For machining materials with Hardness < 350 HB : Tensile Strength <1250 N/mm^2

Surface Finish Characteristics

Titanium Aluminium Nitride (TiAlN) is a violet/grey coloured surface coating with a higher hardness than both TiN and TiCN. This increases drill surface hardness to around 87Rc and utilises aluminium in the coating which imparts greater oxidation stability. This stability is a result of a very thin film (of Aluminium Oxide) which is formed on the surface of the TiAlN. This film is self repairing which leads to increased tool service life. This high performance coating is able to withstand much higher temperatures which allows increased speeds and feeds and semi-dry machining operations. TiAlN coating is especially useful when machining cast iron and tough steels.

Drill & Tap Characteristics

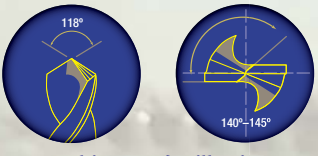
Drill Flute
Refined flute profile with high helix for enhanced chip removal.

Drill Point
Multi-Faceted Point for higher load carrying capacity and enhanced feed rates in the machining of difficult materials.

Tap Thread
Blue Band Taps have a truncated thread after the lead thread to reduce frictional contact with the threaded hole to allow easier penetration of the cutting fluid.

Tap Geometry
The thread and flute configuration is designed for tough materials such as Stainless Steel, Titanium Alloys, Cast Steel, Heat Resisting Steel and Work Hardening Steel.

Tap Material
HSSE-V3 – Vanadium content for toughness.



Multi-Faceted Drill Point

High Tensile Steel
Red Band

The mechanical properties of materials are influenced diversely by the addition of alloying elements and heat treatment processes, resulting in some high-strength, quenched and tempered steels or hardened steels. This range has its own unique set of machining requirements which are satisified by the Red Band Series.
TiAlN coating increases tool surface hardness to 87Rc.
For machining materials with Hardness < 470 HB :
Tensile Strength <1500 N/mm^2

Surface Finish Characteristics

Titanium Aluminium Nitride (TiAlN) is a violet/grey coloured surface coating with a higher hardness than both TiN and TiCN. This increases drill surface hardness to around 87Rc and utilises aluminium in the coating which imparts greater oxidation stability. This stability is a result of a very thin film (of Aluminium Oxide) which is formed on the surface of the TiAlN. This film is self repairing which leads to increased tool service life. This high performance coating is able to withstand much higher temperatures which allows increased speeds and feeds and semi-dry machining operations. TiAlN coating is especially useful when machining cast iron and tough steels.

Drill & Tap Characteristics

Drill Flute

Slow helix, parabolic flute designed with reinforced web for high rigidity under extreme conditions.

Drill Point

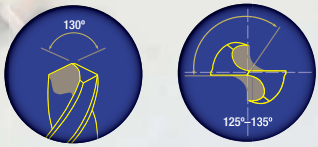
The 130º special notched UX Point provides self centering, easier penetration, improved hole accuracy and improved load distribution. The special notch geometry gives a corrected rake angle of 15º which provides a strong point for harder materials as well as preventing snatching in materials such as Aluminium, Brass, Bronze and Plastics.

Tap Geometry

The thread and flute configuration is designed for high tensile materials such as Tool Steels, Heat Treatable Steels, Spring Steel, Case Hardening Steel, Unalloyed Titanium, Nitriding Steel, Cold Drawn Constructional Steel & High Tensile Steel.

Tap Material

HSSE-V3 – Vanadium content for toughness.



UX Drill Point

Carbon Steel
Green Band

The machinability of different carbon steels is as varied as their properties. The Green Band range is designed to drill and tap across this broad spectrum and are TiN coated to allow increased cutting speeds and extended tool life.
TiN coating increases tool surface hardness to 85Rc.
For machining materials with Hardness < 250 HB :
Tensile Strength <900 N/mm^2

Surface Finish Characteristics

Titanium Nitride (TiN) is a very hard gold coloured surface coating a few microns thick that increases surface hardness to 85Rc. The surface coating is achieved by using Physical Vapour Deposition (PVD). The coating helps to dissipate heat and reduces friction and cold welding. Higher speed and feed rates can be achieved and tool life is greatly increased.

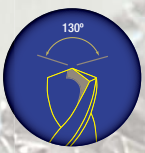
Drill & Tap Characteristics

Drill Flute
33º helix, open profile designed with reinforced web for high rigidity under extreme conditions.

Drill Point
The 130º Split Point provides self centering, easier penetration and improved hole accuracy in all soft-tough steels.

Tap Geometry
The thread and flute configuration is designed for free cutting in medium tensile strength structural steels.

Tap Material
HSSE-V3 – Vanadium content for toughness.



Split Drill Point

Aluminium Yellow Band

The alloying components used to create Aluminium Alloys have an effect on the machining properties of these materials. This generally creates a difficult long chip formation and material which has tendencies to stick to the tool, placing a unique set of demands on tooling. Yellow Band Series contends with these difficulties.
For machining materials with Hardness < 200 HB :
Tensile Strength <700 N/mm^2

Surface Finish Characteristics

With the exception of roll form taps, both the drills and taps in the Yellow Band range are supplied in a bright finish. The bright "as-ground" condition and TiN coatings are the most suitable finish for the ductile range of products these tools are designed to cut.

Drill & Tap Characteristics

Drill Flute
35º helix with open profile designed for efficient swarf evacuation.

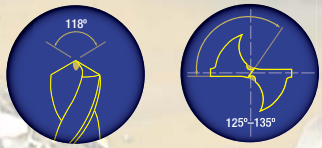
Drill Point
The thinned point reduces end thrust and optimizes centre cutting efficiency with chisel strength.

Tap Geometry
The thread and flute configuration is designed for ductile materials such as Aluminium, Magnesium Alloys, Soft Brass (MS58), Plastic, Zinc Alloys and Copper.

Tap Flutes
Wide flutes allow more efficient swarf removal which prevents clogging and torque build-up which can result in tap failure.

Tap Rake Angle
High rake angle improves shear characteristics and reduces build-up on the cutting edge, allowing tap to cut more freely for extended periods.

Tap Material
HSSE-V3 – Vanadium content for toughness.



Thinned Drill Point

Cast Iron White Band

A highly abrasive material with damping and thermal conductivity, high strength and resistance to wear. Cast Iron is used extensively for mass produced components. The White Band Series is designed for this specific purpose.
TiAlN coating increases tool surface hardness to 87Rc.
For machining materials with Hardness < 300 HB :
Tensile Strength <1000 N/mm^2

Surface Finish Characteristics

Titanium Aluminium Nitride (TiAlN) is a violet/grey coloured surface coating with a higher hardness than both TiN and TiCN. This increases drill surface hardness to around 87Rc and utilizes aluminium in the coating which imparts greater oxidation stability. This stability is a result of a very thin film (of Aluminium Oxide) which is formed on the surface of the TiAlN. This film is self repairing which leads to increased tool service life. This high performance coating is able to withstand much higher temperatures which allows increased speeds and feeds and semi-dry machining operations. TiAlN coating is especially useful when machining cast iron and tough steels.

Drill & Tap Characteristics

Drill Flute

Slow helix, parabolic flute designed with reinforced web for high rigidity under extreme conditions.

Drill Point

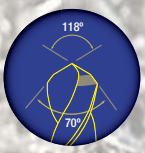
The double angle DX Point 118º / 70º minimises wear on the outer corners of the drill point in highly abrasive materials such as Cast Iron and Reinforced Plastics. The point is web thinned for easier penetration.

Tap Geometry

The thread and flute configuration is designed for highly abrasive materials such as Cast Iron and Reinforced Plastics. White Band Taps utilise an increased number of flutes to reduce torque and increase tap life.

Tap Material

HSSE-V3 – Vanadium content for toughness.



DX Drill Point

Machining Guide

Drilling

Machined Materials	Hardness Brinell	Hardness N/mm²	Cutting Speed m/min	Feed Rate for diameter (mm) 3	5	6	8	10	12	16	20
BLUE BAND DRILLS											
Stainless Steels											
Free Cutting	<250	861	12-22	0.08	0.11	0.12	0.16	0.19	0.20	0.24	0.28
Austenitic	<250	861	10-15	0.08	0.11	0.12	0.16	0.19	0.20	0.24	0.28
Martensitic, Ferritic	>300	971	12-18	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
Titanium											
Pure, Unalloyed	<200	758	20-32	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
Titanium Alloys	>300	971	06-12	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
Nickel											
Pure, Unalloyed	<300	971	10-15	0.08	0.11	0.12	0.16	0.19	0.20	0.24	0.28
RED BAND DRILLS											
Copper											
High Tensile Bronze	<350	1144	15-28	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
Carbon Alloy Steels											
Low Alloy Steel	>250	861	25-30	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
Alloyed, Heat Treated	>300	971	15-20	0.04	0.06	0.06	0.07	0.10	0.11	0.13	0.16
Alloyed, Heat Treated	>350	1144	10-15	0.04	0.06	0.06	0.07	0.10	0.11	0.13	0.16
Nickel											
Nimonic 75	>300	971	06-10	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
Iconel 718 Alloy	<350	1144	04-08	0.04	0.06	0.06	0.07	0.10	0.11	0.13	0.16
GREEN BAND DRILLS											
Carbon Alloy Steels											
Free Cutting Mild Steel	<120	420	40-50	0.12	0.15	0.17	0.22	0.26	0.28	0.32	0.36
Low Carbon Steel	<200	758	30-40	0.08	0.11	0.12	0.16	0.19	0.20	0.24	0.28
Medium Carbon Steel	<250	861	25-35	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
YELLOW BAND DRILLS											
Aluminium Alloys											
Wrought & Extruded	<150	541	50-60	0.12	0.15	0.17	0.22	0.26	0.28	0.32	0.36
Wrought & Treated	>150	541	35-50	0.08	0.11	0.12	0.16	0.19	0.20	0.24	0.28
Cast, Low Silicon <5%	<150	541	30-40	0.08	0.11	0.12	0.16	0.19	0.20	0.24	0.28
Cast, High Silicon >10%	>150	541	23-35	0.08	0.11	0.12	0.16	0.19	0.20	0.24	0.28
Copper											
Pure	<100	–	35-55	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
Brass, Soft	<200	717	40-50	0.15	0.19	0.21	0.28	0.33	0.35	0.40	0.45
Brass, Bronze	>200	717	35-45	0.08	0.11	0.12	0.16	0.19	0.20	0.24	0.28
WHITE BAND DRILLS											
Cast Irons											
Plain Grey Irons	<150	541	35-45	0.12	0.15	0.17	0.22	0.26	0.28	0.32	0.36
Plain SG Iron	<250	861	23-35	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21
Alloy SG Iron Nickel Hard	>250	861	15-28	0.06	0.08	0.09	0.12	0.14	0.15	0.16	0.21

FOR DEEP HOLE DRILLING REDUCE SPEEDS

Drilling speed reduction based on DIN338 Jobber Drill lengths

3 x Drill Diameter reduce speed by 10%
4 x Drill Diameter reduce speed by 20%
5 x Drill Diameter reduce speed by 30%
More than 6 x Drill Diameter reduce speed by 40%

To convert Surface Metres Per Minute to RPM : RPM = (surface m/min x 318.5) ÷ D
where "D" is outside diameter of drill expressed in millimeters

Machining Guide

Tapping

Machined Materials	Hardness Brinell	Hardness N/mm²	Cutting Speed m/min
BLUE BAND TAPS			
Stainless Steels			
Free Cutting	<250	861	12-20
Austenitic	<250	861	08-16
Martensitic, Ferritic	>300	971	07-10
Titanium			
Pure, Unalloyed	<200	758	10-16
Titanium Alloys	>300	971	05-10
Nickel			
Pure, Unalloyed	<300	971	09-15
RED BAND TAPS			
Copper			
High Tensile Bronze	<350	1144	12-28
Carbon Alloy Steels			
Low Alloy Steel	>250	861	12-20
Alloyed, Heat Treated	>300	971	07-15
Alloyed, Heat Treated	>350	1144	05-09
Nickel			
Nimonic 75	>300	971	04-12
Iconel 718 Alloy	<350	1144	03-07
GREEN BAND TAPS			
Carbon Alloy Steels			
Free Cutting Mild Steel	<120	420	20-45
Low Carbon Steel	<200	758	18-40
Medium Carbon Steel	<250	861	14-25
YELLOW BAND TAPS			
Aluminium Alloys			
Wrought & Extruded	<150	541	30-55
Wrought & Treated	>150	541	27-50
Cast, Low Silicon <5%	<150	541	20-35
Cast, High Silicon >10%	>150	541	15-30
Copper			
Pure	<100	–	15-30
Brass, Soft	<200	717	40-50
Brass, Bronze	>200	717	30-50
WHITE BAND TAPS			
Cast Irons			
Plain Grey Irons	<150	541	16-30
Plain SG Iron	<250	861	12-20
Alloy SG Iron Nickel Hard	>250	861	07-14

GENERAL RULE ON TAPPING SPEEDS

When using a tap with a pitch ≥ 2mm use the lower cutting speed.
When using a tap with a pitch ≤ 0.5mm use the greater cutting speed.
When using a tap between these pitches interpolate between the two cutting speeds shown.
Testing is recommended to determine optimum cutting speeds for specific materials.

To convert Surface Metres Per Minute to RPM : RPM = (surface m/min x 318.5) ÷ D
where "D" is outside diameter of tap expressed in millimeters

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