DORMER PRAMET

MATERIAL SPECIFIC SHARK TAPS

2022

DORMER

MATERIAL SPECIFIC SHARK TAPS – GENERAL CONTENT

1 **E472**

DORMER

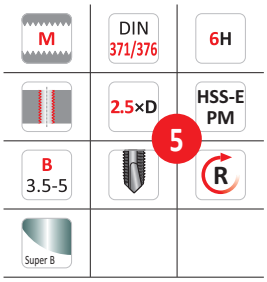
2

Green SHARK Spiral Point Metric Machine Tap, DIN Standard

High performance through hole tap with reinforced or reduced shank for non-ferrous materials. Unique HSS-E-PM substrate with Super-B coating to avoid chip sticking, providing superior performance, consistency and extended tool life.

3

SHARK



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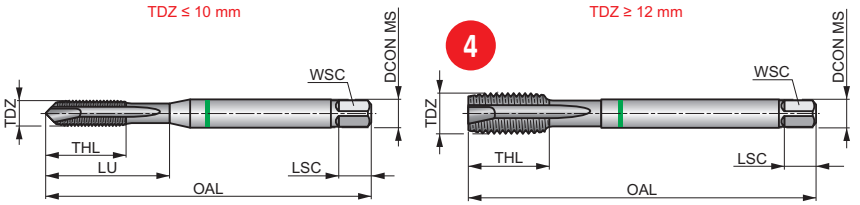


Workpiece material group suitability and starting values for cutting speed (m/min).

P1.1	P1.2	P1.3	P2.1	P2.2	N1.1	N1.2	6 N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N4.1
◪34	◪38	◪40	◪29	◪24	◪35	◪26	■18	■46	■42	■30	◪76	■45	◪30

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD	LU
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(mm)
E472M3	3	0.50	56.0	9	3.50	2.70	6	2	2.50	18.00
E472M4	4	0.70	63.0	12	4.50	3.40	6	2	3.30	21.00
E472M5	5	0.80	70.0	13	6.00	4.90	8	2	4.20	25.00
E472M6	6	1.00	80.0	15	6.00	4.90	8	3	5.00	30.00
E 7	8	1.25	90.0	18	8.00 8	6.20	9	3	6.80	35.00
E472M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E472M12	12	1.75	110.0	23	9.00	7.00	10	3	10.30	–
E472M16	16	2.00	110.0	25	12.00	9.00	12	4	14.00	–
E472M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50	–

Pos.	Description
1	Designation of taps
2	Product description
3	Illustrative picture
4	Schematic drawing of tool

Pos.	Description
5	Product features
6	Material group recommendations incl. speed and feed guidance
7	Product code
8	Product dimensions

Typical page with tap holder displayed – specific page details will differ.

General icons

■	Primary use
◪	Possible use

Basic standard group (BSG)

ANSI B94.9	ANSI B94.9 – Tap Standard
ANSI	ANSI – Tap Standard
ANSI DORMER	ANSI Dormer Standard
DIN 2174	DIN 2174 – Forming Tap Standard
DIN 2181	DIN 2181 – Hand Tap Standard
DIN 2184-1	DIN 2184-1 – Tap Standard
DIN 351	DIN 351 – Straight Flute Tap Standard
DIN 352	DIN 352 – Thread Form Standard
DIN 357	DIN 357 – Nut Tap Standard
DIN 371	DIN 371 – Thread Form Standard
DIN 374	DIN 374 – MF Thread Standard
DIN 376	DIN 376 – Thread Form Standard
DIN 40432	DIN 40432 – PG Thread Standard
DIN 5156	DIN 5156 – Thread Form Standard
DIN 5157	DIN 5157 – Pipe Thread Standard
DIN DORMER	DIN Dormer Standard
DIN 371/376	DIN Thread Standard (based on size range) DIN 371 if Ø ≤ 10 mm / DIN 376 if Ø ≥ 12 mm
ISO 2283	ISO 2283 – Long Shank Tap Standard
ISO 2284	ISO 2284 – Pipe Tap Standard
ISO 529	ISO 529 – Tap Standard
ISO DORMER	ISO Dormer Standard

Material code (BMC)

HSS-E PM	High Speed Cobalt Powder Metal Tool Material
HSS-E	High Speed Cobalt Steel Tool Material
HSS	High Speed Steel Tool Material
HM	Hard Material (Solid Carbide)

Coating

Bright	Bright (uncoated)
Bright ST	Combination Bright and Steam Tempered
Cr	Flash Chrome (Hard Chrome) Plating
Super B	Special TiAlN Coating (+ WC/C)
ST	Steam Tempered (Steam Oxide) Surface Treatment
TiAlN Top	Titanium Aluminium Nitride Coating (with smoothing process)
TiAlN	Titanium Aluminium Nitride Coating
TiN	Titanium Nitride Coating
TiCN	Titanium Carbon Nitride Coating

Coolant exit style code (CXSC)

	Through Tool Coolant – Radial Exit
	Through Tool Coolant – Axial Exit

Flute helix angle (FHA)

λ 15°	15° Helix Angle (Flute)
λ 27°	27° Helix Angle (Flute)
λ 30°	30° Helix Angle (Flute)
λ 35°	35° Helix Angle (Flute)
λ 40°	40° Helix Angle (Flute)
λ 45°	45° Helix Angle (Flute)
λ 48°	48° Helix Angle (Flute)

SOLID CARBIDE TAPS – HSS TAPS – ICONS OVERVIEW

Flute geometry (FDC)

	Fluteless Geometry (Threadforming)
	Oil Grooves Geometry (Threadforming)
	Spiral Flute Geometry
	Spiral Point Geometry
	Straight Flute Geometry

Hand (Cutting direction)

	Left Hand Rotation/Cutting
	Right Hand Rotation/Cutting

Tap chamfer style (TCS)

E 1.5-2	Full Bottoming Tap Chamfer (1.5 – 2 Pitch Lead)
B 3.5-5	Plug Tap Chamfer (3.5 – 5 Pitch Lead)
C 2-3	Semi-Bottoming Tap Chamfer (2 – 3 Pitch Lead)
C 2-3.5	Semi-Bottoming Tap Chamfer (2 – 3.5 Pitch Lead)
A 6-8 C 2-3	Tap Chamfers: A = Taper (6 – 8 Pitch Lead) & C = Semi-Bottoming (2 – 3 Pitch Lead)
C 2-3 D 18-20	Tap Chamfers: C = Semi-Bottoming (2 – 3 Pitch Lead) & D = Nut Style (18 – 20 Pitch Lead)

Thread form type (THFT)

NPSF	Thread Form, American National Pipe Straight Fuel (Dryseal)
NPSM	Thread Form, American National Pipe Straight Mechanical
NPT	Thread Form, American National Pipe Taper
NPTF	Thread Form, American National Pipe Taper Fuel (Dryseal)
BA	Thread Form, British Association Screw Threads
BSF	Thread Form, British Standard Fine
G	Thread Form, British Standard Pipe (BSP)
Rc	Thread Form, British Standard Taper Pipe, 1:16 Taper (BSPT)
BSW	Thread Form, British Standard Whitworth
M	Thread Form, Metric Coarse
MF	Thread Form, Metric Fine
EGM	Thread Form, Metric ISO (Screw Thread Insert Type)
PG	Thread Form, Steel Conduit DIN 40430 (electrical)
UNC	Thread Form, Unified Coarse
UNF	Thread Form, Unified Fine
UN	Thread Form, Unified National

Thread tolerance zone class (TCTR)

6H	DIN Thread Pitch Diameter Tolerance Zone (high basic pitch diameter)
6G	DIN Thread Pitch Diameter Tolerance Zone (low basic pitch diameter)
6HX	DIN Thread Pitch Diameter Tolerance Zone (with increased pitch diameter)
6GX	DIN Thread Pitch Diameter Tolerance Zone (with increased pitch diameter)
2B	Internal Inch Thread Medium Class of Fit
2BX	Internal Inch Thread Medium Class of Fit (with increased pitch diameter)
Medium	Medium Inch Thread Class of Fit
Normal	Normal Fit Class for Pipe Thread

Threading application

	Blind Hole Application
	Through Hole Application
	Through or Blind Hole Application

Usable length diameter ratio (ULDR)

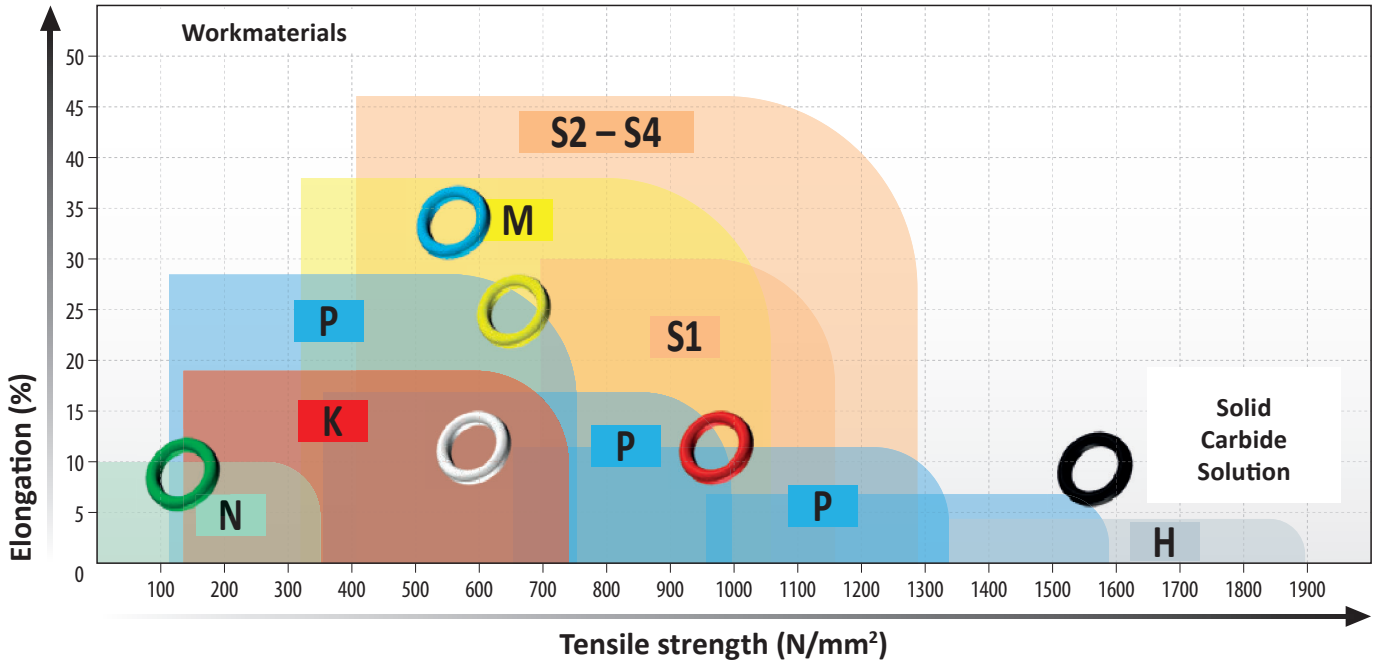
1.5×D	1.5×D Useable Tool Depth to Diameter Ratio
2.5×D	2.5×D Useable Tool Depth to Diameter Ratio
2×D	2×D Useable Tool Depth to Diameter Ratio
3.5×D	3.5×D Useable Tool Depth to Diameter Ratio
3×D	3×D Useable Tool Depth to Diameter Ratio

MATERIAL SPECIFIC TAPS

SHARK

MATERIAL SPECIFIC APPLICATION TAPS

Dormer's application-based ranges of DIN taps, branded Shark Line, are renowned for their high performance and are easily recognizable by their colored rings, denoting recommendation for use on specific materials.



FEATURES AND BENEFITS

COLOUR RING CODING

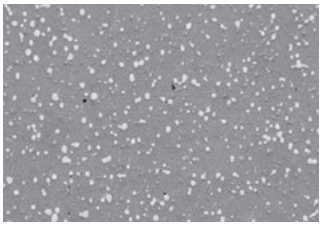
- The colour ring on the tool shank identifies suitability for specific materials and enables **quick and easy tool selection**.

EDGE TREATMENT (Black, Red, Yellow, Blue Shark)

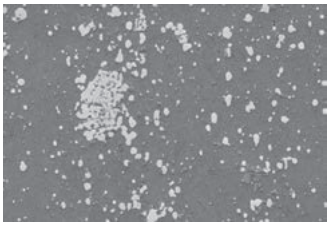
- Spiral flute taps incorporate a special edge treatment to increase strength and reduce the chance of micro-chipping on the cutting edges. This considerably improves **performance and tool life** as well as process security.

MATERIAL

Shark taps are manufactured from a unique powder metallurgy tool steel different from any other HSS-E-PM. This provides an unbeatable combination of toughness and edge strength, allowing the taps to perform at higher cutting temperatures while offering excellent performance and longer tool life.



Unique HSS-E-PM material used for **SHARK TAPS** (note the evenly dispersed grain structure).



Traditional HSS-E (M35) material.

STRUCTURAL, PLAIN CARBON & LOW ALLOY STEELS

YELLOW SHARK

- **SURFACE TREATMENT**
  Hard chrome plating (Cr) with an additional edge treatment prevents built up edge when tapping in materials prone to sticking to the cutting edges.
- **FLUTE GEOMETRY**
  Available in spiral point for through holes and spiral flute (40° angle) for blind holes. Special flute geometry on Yellow Shark spiral flute taps prevents nest formation of chips, reducing the risk of re-cutting chips on reversal.
- **THREAD FORMS**
  Metric and Metric Fine
- **PRODUCT CODES**
  E297, E298, E299, E300

YELLOW SHARK 3×D

- **SURFACE TREATMENT**
  TiAlN-Top coating with an additional edge treatment.
- **FLUTE GEOMETRY**
  Spiral flute angle of 48° facilitates smooth and fast chip evacuation, making it suitable for threading deep blind holes (3×D). The increased thread relief also enables higher cutting speeds in high strength steels.
- **CUTTING GEOMETRY**
  The special three radii profile with a constant rake angle along the flute length leads to a better control of cutting properties and prevents nest formation of chips.
- **BACK TAPERED**
  Back taper further facilitates chip evacuation, reducing chipping on the last threads of the taps and also reducing torque when the tap reverses.
- **TAPPING ATTACHMENT (RECOMMENDATION)**
  When using 48° spiral flute Yellow Shark taps, it is recommended to use a tool holder with minimal float or soft start.
- **THREAD FORMS**
  Metric
- **PRODUCT CODE**
  E412

STAINLESS STEELS

BLUE SHARK

- **SURFACE TREATMENT**
  Steam-tempered or Super-B (TiAlN + WC/C) coated with an additional edge treatment.
- **FLUTE GEOMETRY**
  Available in spiral point for through holes and spiral flute (40° angle) for blind holes.
- **BACK TAPERED**
  Back taper on spiral flute taps further facilitates chip evacuation, reducing chipping on the last threads of the taps and also reducing torque when the tap reverses.
- **THREAD FORMS**
  Metric, Metric Fine and G(BSP)
- **PRODUCT CODES**
  E238, E239, E240, E241, E382, E383, E384

BLUE SHARK 3×D

- **SURFACE TREATMENT**
  Super-B (TiAlN + WC/C) coating with an additional edge treatment.
- **FLUTE GEOMETRY**
  Spiral flute angle of 48° facilitates smooth and fast chip evacuation, making it suitable for threading deep blind holes (3×D). The increased thread relief ensures process security when tapping resilient materials such as stainless steel.
- **CUTTING GEOMETRY**
  The special three radii profile with a constant rake angle along the flute length leads to a better control of cutting properties and prevents nest formation of chips.
- **BACK TAPERED**
  Back taper further facilitates chip evacuation, reducing chipping on the last threads of the taps and also reducing torque when the tap reverses.
- **TAPPING ATTACHMENT (RECOMMENDATION)**
  When using 48° spiral flute Blue Shark taps, it is recommended to use a tool holder with minimal float or soft start.
- **THREAD FORMS**
  Metric
- **PRODUCT CODE**
  E414

SHARK

MATERIAL SPECIFIC APPLICATION TAPS

ALLOY STEELS

RED SHARK

- **SURFACE TREATMENT**
  Bright or TiAlN-Top coated with an additional edge treatment.
- **FLUTE GEOMETRY**
  Available in spiral point for through holes and spiral flute (45° angle) for blind holes.
- **BACK TAPERED**
  Back taper on spiral flute taps further facilitates chip evacuation, reducing chipping on the last threads of the taps and also reducing torque when the tap reverses.
- **CUTTING GEOMETRY (SPIRAL FLUTE TAPS)**
  The special three-radii profile with a constant rake angle along the flute length leads to better control of cutting properties and prevents nest formation of chips.
- **TAPPING ATTACHMENT (RECOMMENDATION)**
  When using spiral flute Red Shark taps, it is recommended to use a tool holder with minimal float or soft start.
- **THREAD FORMS**
  Metric
- **PRODUCT CODES**
  E255, E256, E260, E261

HIGH STRENGTH STEELS

NEW

BLACK SHARK

- **SURFACE TREATMENT**
  TiAlN-Top coating with an additional edge treatment.
- **FLUTE GEOMETRY**
  Spiral point or low helix spiral flute geometries with low rake angle for good chip control and edge strength.
- **CUTTING GEOMETRY (SPIRAL FLUTE TAPS)**
  The special three-radii profile with a constant rake angle along the flute length leads to better control of cutting properties and prevents nest formation of chips.
- **TAPPING ATTACHMENT (RECOMMENDATION)**
  When using Black Shark taps, it is recommended to use synchronized (rigid) tapping.
- **THREAD FORMS**
  Metric
- **PRODUCT CODES**
  E334, E335

SHARK

NON-FERROUS MATERIALS

GREEN SHARK

- **SURFACE TREATMENT**
  Bright or Super-B (TiAlN + WC/C) coated.
- **FLUTE GEOMETRY**
  Available in spiral point for through holes and spiral flute (35° angle) for blind holes.
- **CUTTING GEOMETRY (SPIRAL FLUTE TAPS)**
  The special three radii profile with a constant rake angle along the flute length leads to a better control of cutting properties and prevents nest formation of chips.
- **THREAD FORMS**
  Metric
- **PRODUCT CODES**
  E471, E472, E473, E474

CAST IRONS

WHITE SHARK

- **SURFACE TREATMENT**
  Steam-tempered or TiAlN-Top coated.
- **FLUTE GEOMETRY**
  Straight flute design gives excellent performance when threading both through and blind holes in short chipping materials.
- **THREAD FORMS**
  Metric
- **PRODUCT CODES**
  E201, E252, E390

MATERIAL SPECIFIC TAPS – TOOL MATERIAL NAVIGATOR

Tool materials		
Sintered Cobalt High Speed Steel	HSS-E PM	HSS-E-PM is a Cobalt High Speed Powder Metal substrate which has been produced using powder metal technology. High speed steel produced by this method exhibits superior toughness and grindability due to the uniform and consistent grain structure. High performance taps and end mills have a particular advantage when manufactured from this substrate.

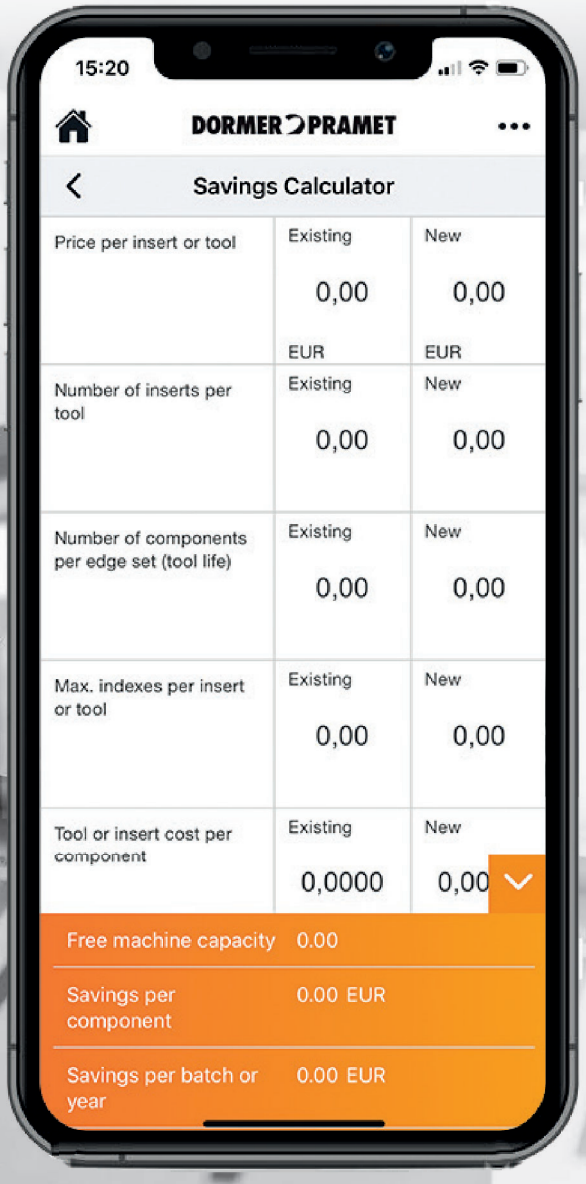
Surface Treatments		
Bright (uncoated)		Bright finish (uncoated surface) improves chip flow in soft or non-ferrous materials and maintains sharp cutting edges in abrasive materials.
Steam Tempering		Steam tempering gives a strongly adhering blue oxide surface that acts to retain cutting fluid and prevent chip to tool welding, thereby counteracting the formation of a built-up edge. Steam tempering can be applied to any bright tool but is most effective on drills and taps.

Surface Coatings		
Titanium Aluminium Nitride Coatings (TiAlN & TiAlN-Top)	 	Titanium Aluminium Nitride is a multi layer ceramic coating applied by PVD coating technology, which exhibits high toughness and oxidation stability. These properties make it ideal for higher speeds and feeds, while at the same time improving tool life. TiAlN is used in drilling, tapping, and milling applications and can be suitable for use when machining without coolant. TiAlN-Top coating is the same as TiAlN but with a post-coating process designed to smooth out imperfections, enhance chip flow and reduce built up edge.
Super-B Coating (TiAlN/WC/C)		Super B is a Titanium Aluminium Nitride + Tungsten Carbide + Carbon Coating used for wet and minimal lubrication machining in drilling, milling and tapping applications. Very effective for cast iron, hardened steels and heat resistant super alloys.
Chromium Nitride Coating (CrN)		Hard chromium (Cr) for cutting tool applications provides excellent wear and abrasion resistance due to lowering the coefficient of friction. Only designed for machining soft and gummy materials to promote chip flow and to prevent workpiece materials from sticking to the tool. Hard chromium increases the surface hardness of the tool and is especially effective for tapping soft structural steels, copper and brass materials.

DORMER PRAMET

POCKET SAVER

Our machining calculator allows you to measure the savings based on different products and applications. A useful pocket-sized tool, which will help keep cash in your pockets! **Simply Reliable.**



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Thread form (THFT)	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Basic standard group (BSG)	DIN 371	DIN 376	DIN 371/376	DIN 371/376	DIN 371/376	DIN 371/376	DIN DORMER	DIN 371/376	DIN 371/376	DIN 371/376	DIN 371/376	DIN 371/376	DIN 371/376	DIN 371/376
Thread tolerance class (TCTR)	6HX	6HX	6HX	6H	6HX	6HX	6HX	6H	6H	6H	6H	6H	6H	6H
Threading application														
Usable length (ULDR)	2×D	2×D	2×D	2.5×D	2.5×D	2.5×D	2.5×D	2.5×D	2.5×D	2.5×D	2.5×D	2.5×D	2×D	3×D
Material code (BMC)	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM
Tap chamfer style (TCS)	C 2-3	C 2-3	C 2-3	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	C 2-3	C 2-3
Flute Geometry (FDC)														
Flute helix angle (FHA)													λ 40°	λ 48°
Hand (Cutting direction)	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Coating	ST	ST	TiAlN	Cr	Bright	TiAlN Top	TiAlN Top	ST	Super B	Bright	Super B	Cr		TiAlN Top
													
	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK
Product Family Code	E201	E252	E390	E297	E255	E256	E334	E240	E241	E471	E472	E298	E412	
	M3 – M10	M8 – M24	M3 – M20	M3 – M30	M3 – M20	M3 – M20	M3 – M12	M3 – M30	M3 – M20	M3 – M20	M3 – M20	M3 – M30	M3 – M30	
	36	37	38	39	40	41	42	43	44	45	46	47	48	
P	P1				■						◪	◪	■	■
	P2				■	■	■		◪	◪	◪	◪	■	■
	P3				◪	■	■	◪	◪	◪			◪	■
	P4				◪	■	■	■	◪	◪			◪	■
M	M1								■	■				◪
	M2								■	■				◪
	M3								■	■				◪
	M4								■	◪				◪
K	K1	■	■	■										
	K2	■	■	■										
	K3	■	■	■										
	K4	◪	◪	◪										
	K5	■	■	■										
N	N1										■	◪		◪
	N2										■	■		◪
	N3	◪	◪	◪	■						■	◪	■	◪
	N4	■	■	■							■	◪		
	N5													
S	S1					◪	◪	■						
	S2					◪	◪							
	S3					◪	◪	■						
	S4					◪	◪							
H	H1													
	H2													
	H3							◪						
	H4													

■ Primary use ◪ Possible use

	M	M	M	M	M	M	M	M	MF	MF	MF	MF	G
	DIN 371/376	DIN 371/376	DIN DORMER	DIN 371/376	DIN 371/376	DIN 371/376	DIN 371/376	DIN 371/376	DIN 374	DIN 374	DIN 374	DIN 374	DIN 5156
	6HX	6HX	6HX	6H	6H	6H	6H	6H	6H	6H	6H	6H	Normal
	2.5×D	2.5×D	1.5×D	2.5×D	2.5×D	3×D	2.5×D	2.5×D	2.5×D	2.5×D	2×D	2×D	2×D
	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM
	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	B 3.5-5	B 3.5-5	C 2-3	C 2-3	C 2-3
	λ 45°	λ 45°	λ 15°	λ 40°	λ 40°	λ 48°	λ 35°	λ 35°			λ 40°	λ 40°	λ 40°
	Bright	TiAlN Top	TiAlN Top	ST	Super B	Super B	Bright	Super B	Cr	ST	Cr	ST	ST
	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK	SHARK
	E260	**E261**	**E335**	**E238**	**E239**	**E414**	**E473**	**E474**	**E299**	**E384**	**E300**	**E383**	**E382**
	M3 – M20	M3 – M20	M3 – M12	M3 – M30	M3 – M20	M3 – M20	M3 – M20	M3 – M20	M4 – M30	M6 – M20	M4 – M30	M6 – M20	1/8 – 1"
	49	50	51	52	53	54	55	56	57	58	59	60	61
P1							◪	◪	■		■		
P2	■	■		◪	◪	◪	◪	◪	■	◪	■	◪	◪
P3	■	■	◪	◪	◪	◪			◪	◪	◪	◪	◪
P4	■	■	■	◪	◪	◪			◪	◪	◪	◪	◪
M1				■	■	■				■		■	■
M2				■	■	■				■		■	■
M3				■	■	■				■		■	■
M4				■	◪					■		■	■
K1													
K2													
K3													
K4													
K5													
N1							■	◪					
N2							■	■					
N3							■	◪	■		■		
N4							■	◪					
N5													
S1	◪	◪	■										
S2	◪	◪											
S3	◪	◪	■										
S4	◪	◪											
H1													
H2													
H3			◪										
H4													

■ Primary use ◪ Possible use

E201

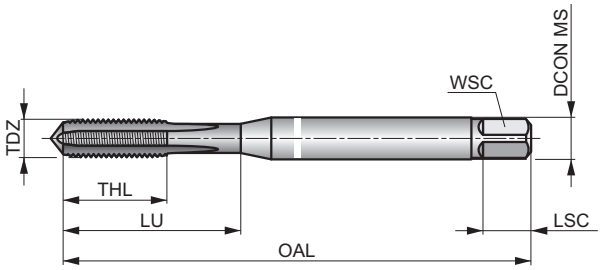
DORMER

White SHARK Straight Flute Metric Machine Tap, DIN Standard

Straight flute tap with reduced shank for blind and through holes in short chipping cast iron and high strength non-ferrous materials. HSS-E-PM substrate provides superior performance, consistency and extended tool life. Steam tempered surface acts to retain cutting fluid and prevent chip to tool welding.

SHARK

M	DIN 371	6HX
LU	2×D	HSS-E PM
C 2-3		R
ST		



Workpiece material group suitability and starting values for cutting speed (m/min).

K1.1	K1.2	K1.3	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5
■ 15	■ 11	■ 8	■ 18	■ 15	◪ 12	■ 16	■ 12	◪ 10	■ 15	■ 11	◪ 8	◪ 7	◪ 6

K5.1	K5.2	K5.3	N2.3	N3.2	N4.2
■ 17	■ 13	◪ 10	◪ 15	◪ 20	■ 10

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD	LU
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(mm)
E201M3	3	0.50	56.0	9	3.50	2.70	6	3	2.50	18.00
E201M4	4	0.70	63.0	12	4.50	3.40	6	4	3.30	21.00
E201M5	5	0.80	70.0	13	6.00	4.90	8	4	4.20	25.00
E201M6	6	1.00	80.0	15	6.00	4.90	8	4	5.00	30.00
E201M8	8	1.25	90.0	18	8.00	6.20	9	4	6.80	35.00
E201M10	10	1.50	100.0	20	10.00	8.00	11	4	8.50	39.00

E252

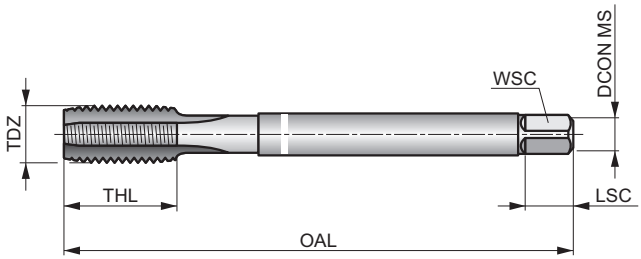
DORMER

White SHARK Straight Flute Metric Machine Tap, DIN Standard

Straight flute tap with reinforced shank for blind and through holes in short chipping cast iron and high strength non-ferrous materials. HSS-E-PM substrate provides superior performance, consistency and extended tool life. Steam tempered surface acts to retain cutting fluid and prevent chip to tool welding.

SHARK

M	DIN 376	6HX
	2×D	HSS-E PM
C 2-3		R
ST		



Workpiece material group suitability and starting values for cutting speed (m/min).

K1.1	K1.2	K1.3	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5
■ 15	■ 11	■ 8	■ 18	■ 15	◪ 12	■ 16	■ 12	◪ 10	■ 15	■ 11	◪ 8	◪ 7	◪ 6

K5.1	K5.2	K5.3	N2.3	N3.2	N4.2
■ 17	■ 13	◪ 10	◪ 15	◪ 20	■ 10

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)
E252M8	8	1.25	90.0	18	6.00	4.90	8	4	6.80
E252M10	10	1.50	100.0	20	7.00	5.50	8	4	8.50
E252M12	12	1.75	110.0	23	9.00	7.00	10	4	10.30
E252M14	14	2.00	110.0	25	11.00	9.00	12	4	12.00
E252M16	16	2.00	110.0	25	12.00	9.00	12	4	14.00
E252M18	18	2.50	125.0	30	14.00	11.00	14	4	15.50
E252M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50
E252M22	22	2.50	140.0	34	18.00	14.50	17	4	19.50
E252M24	24	3.00	160.0	38	18.00	14.50	17	4	21.00

E390

DORMER

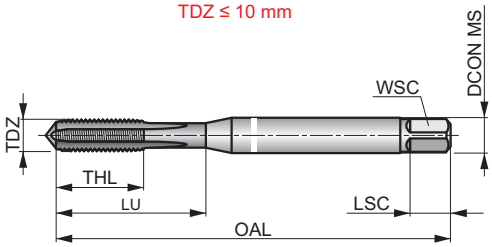
White SHARK Straight Flute Metric Machine Tap, DIN Standard

High performance TiAlN coated tap for blind and through holes in short chipping materials, such as cast iron and non-ferrous metals. Premium HSS-E-PM substrate provides superior performance, consistency and extended tool life. Up to M10 with reinforced and from M12 with reduced shank.

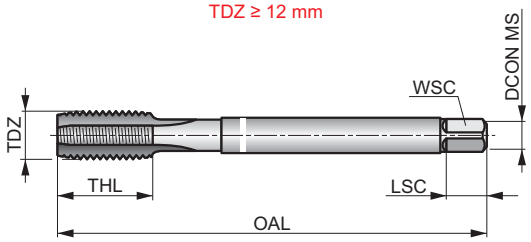
SHARK

M	DIN 371/376	6HX
LU	2×D	HSS-E PM
C 2-3		R
TiAlN		

TDZ ≤ 10 mm



TDZ ≥ 12 mm



Workpiece material group suitability and starting values for cutting speed (m/min).

K1.1	K1.2	K1.3	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5
■ 30	■ 22	■ 17	■ 43	■ 35	◪ 28	■ 38	■ 29	◪ 24	■ 35	■ 27	◪ 20	◪ 17	◪ 14

K5.1	K5.2	K5.3	N2.3	N3.2	N4.2
■ 40	■ 30	◪ 23	◪ 20	◪ 30	■ 15

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD	LU
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(mm)
E390M3	3	0.50	56.0	9	3.50	2.70	6	3	2.50	18.00
E390M4	4	0.70	63.0	12	4.50	3.40	6	4	3.30	21.00
E390M5	5	0.80	70.0	13	6.00	4.90	8	4	4.20	25.00
E390M6	6	1.00	80.0	15	6.00	4.90	8	4	5.00	30.00
E390M8	8	1.25	90.0	18	8.00	6.20	9	4	6.80	35.00
E390M10	10	1.50	100.0	20	10.00	8.00	11	4	8.50	39.00
E390M12	12	1.75	110.0	23	9.00	7.00	10	4	10.30	–
E390M16	16	2.00	110.0	25	12.00	9.00	12	4	14.00	–
E390M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50	–

E297

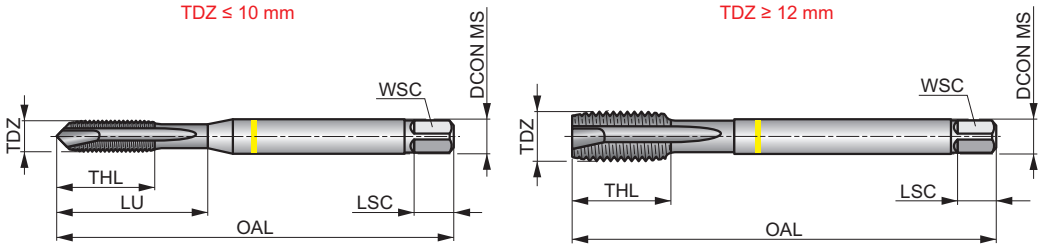
DORMER

Yellow SHARK Spiral Point Metric Machine Tap, DIN Standard

High performance through hole tap for low carbon and alloyed steel and non-ferrous materials. Unique HSS-E-PM substrate with additional edge treatment provides consistency and process security. Hard chrome coated to increase the surface hardness and reduce built-up edge for increased performance and tool life.

SHARK

M	DIN 371/376	6H
	2.5×D	HSS-E PM
B 3.5-5		R
Cr		



Workpiece material group suitability and starting values for cutting speed (m/min).

P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P4.1	N3.1	N3.2	N3.3
■ 24	■ 27	■ 28	■ 20	■ 18	◪ 16	■ 15	◪ 12	◪ 9	■ 51	■ 30	◪ 15

Products from this series are also available in set with drills. Please see L114.

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD	LU
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(mm)
E297M3	3	0.50	56.0	9	3.50	2.70	6	3	2.50	18.00
E297M4	4	0.70	63.0	12	4.50	3.40	6	3	3.30	21.00
E297M5	5	0.80	70.0	13	6.00	4.90	8	3	4.20	25.00
E297M6	6	1.00	80.0	15	6.00	4.90	8	3	5.00	30.00
E297M8	8	1.25	90.0	18	8.00	6.20	9	3	6.80	35.00
E297M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E297M12	12	1.75	110.0	23	9.00	7.00	10	3	10.30	–
E297M14	14	2.00	110.0	25	11.00	9.00	12	3	12.00	–
E297M16	16	2.00	110.0	25	12.00	9.00	12	3	14.00	–
E297M18	18	2.50	125.0	30	14.00	11.00	14	3	15.50	–
E297M20	20	2.50	140.0	30	16.00	12.00	15	3	17.50	–
E297M22	22	2.50	140.0	34	18.00	14.50	17	4	19.50	–
E297M24	24	3.00	160.0	38	18.00	14.50	17	4	21.00	–
E297M27	27	3.00	160.0	38	20.00	16.00	19	4	24.00	–
E297M30	30	3.50	180.0	45	22.00	18.00	21	4	26.50	–

E255

DORMER

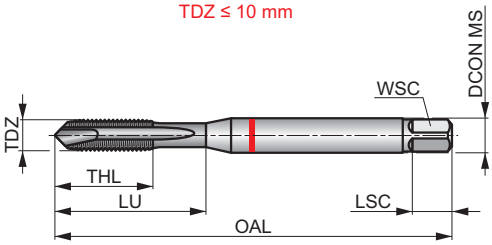
Red SHARK, Spiral Point Metric Machine Tap, DIN Standard

Through hole tap with reinforced or reduced shank for medium to high strength steels. Unique HSS-E-PM steel with bright surface finish provide consistency and process security.

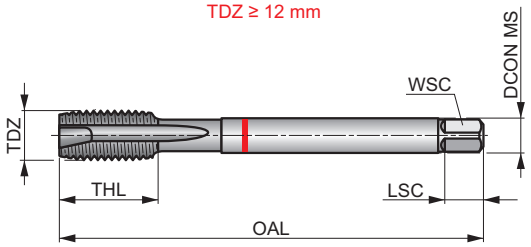
SHARK

M	DIN 371/376	6HX
	2.5×D	HSS-E PM
B 3.5-5		R
Bright		

TDZ ≤ 10 mm



TDZ ≥ 12 mm



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	S1.2	S2.1	S3.1	S4.1
■11	■10	■8	■7	■6	■5	◪2	◪3	◪2	◪2

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E255M3	3	0.50	56.0	9	3.50	2.70	6	3	2.50	18.00
E255M4	4	0.70	63.0	12	4.50	3.40	6	3	3.30	21.00
E255M5	5	0.80	70.0	13	6.00	4.90	8	3	4.20	25.00
E255M6	6	1.00	80.0	15	6.00	4.90	8	3	5.00	30.00
E255M8	8	1.25	90.0	18	8.00	6.20	9	3	6.80	35.00
E255M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E255M12	12	1.75	110.0	23	9.00	7.00	10	3	10.30	–
E255M14	14	2.00	110.0	25	11.00	9.00	12	3	12.00	–
E255M16	16	2.00	110.0	25	12.00	9.00	12	3	14.00	–
E255M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50	–

E256

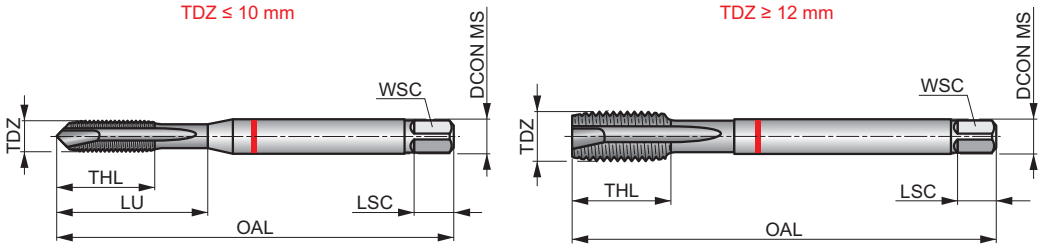
DORMER

Red SHARK Spiral Point Metric Machine Tap, DIN Standard

High performance through hole tap with reinforced or reduced shank for medium to high strength steel. Unique HSS-E-PM substrate along with TiAlN-Top coating and edge treatment provide superior performance, consistency, extended tool life and higher process security.

SHARK

M	DIN 371/376	6HX
	2.5×D	HSS-E PM
B 3.5-5		R
TiAlN Top		



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	S1.2	S2.1	S3.1	S4.1
■ 27	■ 25	■ 20	■ 17	■ 15	■ 13	◪ 10	◪ 3	◪ 4	◪ 3	◪ 3

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E256M3	3	0.50	56.0	9	3.50	2.70	6	3	2.50	18.00
E256M4	4	0.70	63.0	12	4.50	3.40	6	3	3.30	21.00
E256M5	5	0.80	70.0	13	6.00	4.90	8	3	4.20	25.00
E256M6	6	1.00	80.0	15	6.00	4.90	8	3	5.00	30.00
E256M8	8	1.25	90.0	18	8.00	6.20	9	3	6.80	35.00
E256M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E256M12	12	1.75	110.0	23	9.00	7.00	10	3	10.30	–
E256M16	16	2.00	110.0	25	12.00	9.00	12	3	14.00	–
E256M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50	–

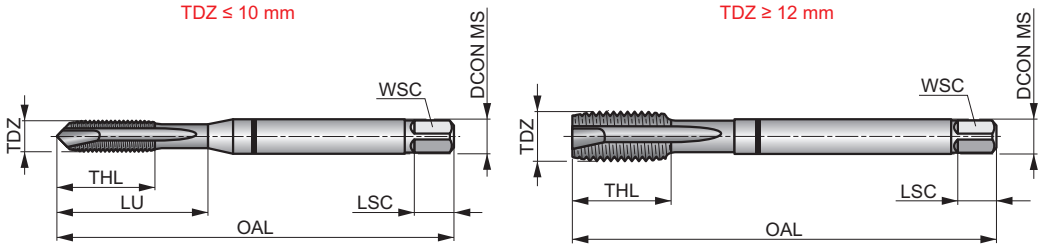
E334

Black SHARK Spiral Point Metric Machine Tap, DIN Standard

High performance through hole tap with reinforced or reduced shank designed for efficient tapping in high strength steels and titanium alloys. Unique HSS-E-PM substrate, TiAlN-Top coating and an additional edge treatment provide high process security, superior performance, consistency and extended tool life.

SHARK

M	DIN DORMER	6HX
	2.5×D	HSS-E PM
B 3.5-5		R
TiAlN Top		



Workpiece material group suitability and starting values for cutting speed (m/min).

P3.3	P4.2	P4.3	S1.2	S1.3	S3.1	S3.2	H3.1
■17	■13	■10	■13	■8	■5	■3	◪7

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E334M3	3	0.50	63.0	12	4.50	3.40	6	3	2.50	12.00
E334M4	4	0.70	70.0	17	6.00	4.90	8	3	3.30	17.00
E334M5	5	0.80	80.0	20	6.00	4.90	8	3	4.20	20.00
E334M6	6	1.00	90.0	24	8.00	6.20	9	3	5.00	24.00
E334M8	8	1.25	100.0	32	10.00	8.00	11	3	6.80	32.00
E334M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E334M12	12	1.75	110.0	23	9.00	7.00	10	4	10.30	–

E240

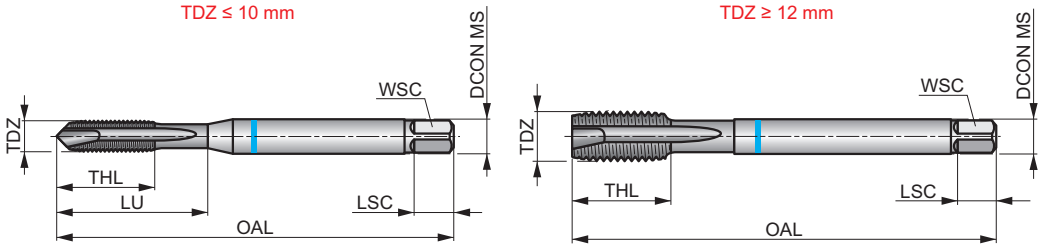
DORMER

Blue SHARK Spiral Point Metric Machine Tap, DIN Standard

Through hole tap with reinforced or reduced shank for medium strength stainless steel. Unique HSS-E-PM substrate along with additional edge treatment provide consistency and process security. Steam tempered surface acts to retain cutting fluid and prevent chip to tool welding.

SHARK

M	DIN 371/376	6H
	2.5×D	HSS-E PM
B 3.5-5		R
ST		



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.3	P4.1	P4.2	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1
◪8	◪10	◪9	◪7	■11	■9	■10	■8	■8	■7	■6	■5

Products from this series are also available in set with drills. Please see L114.

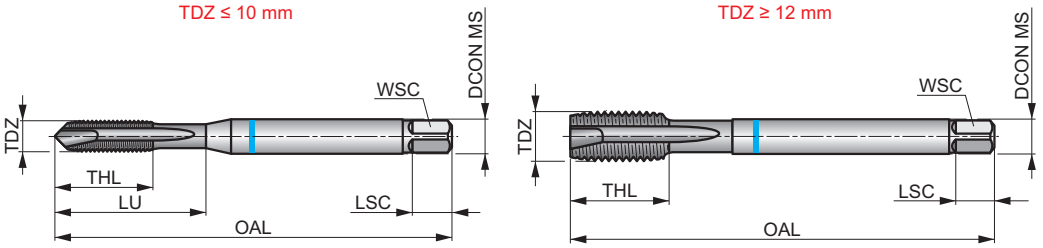
Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD	LU
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(mm)
E240M3	3	0.50	56.0	9	3.50	2.70	6	3	2.50	18.00
E240M4	4	0.70	63.0	12	4.50	3.40	6	3	3.30	21.00
E240M5	5	0.80	70.0	13	6.00	4.90	8	3	4.20	25.00
E240M6	6	1.00	80.0	15	6.00	4.90	8	3	5.00	30.00
E240M8	8	1.25	90.0	18	8.00	6.20	9	3	6.80	35.00
E240M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E240M12	12	1.75	110.0	23	9.00	7.00	10	4	10.30	–
E240M14	14	2.00	110.0	25	11.00	9.00	12	4	12.00	–
E240M16	16	2.00	110.0	25	12.00	9.00	12	4	14.00	–
E240M18	18	2.50	125.0	30	14.00	11.00	14	4	15.50	–
E240M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50	–
E240M22	22	2.50	140.0	34	18.00	14.50	17	4	19.50	–
E240M24	24	3.00	160.0	38	18.00	14.50	17	4	21.00	–
E240M27	27	3.00	160.0	38	20.00	16.00	19	4	24.00	–
E240M30	30	3.50	180.0	45	22.00	18.00	21	4	26.50	–

E241

Blue SHARK Spiral Point Metric Machine Tap, DIN Standard

High performance through hole tap with reinforced or reduced shank for medium strength stainless steel. Unique HSS-E-PM substrate with Super-B coating and additional edge treatment providing superior performance, consistency and extended tool life.

SHARK



M	DIN 371/376	6H
	2.5×D	HSS-E PM
B 3.5-5		R
Super B		

Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.3	P4.1	P4.2	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3	M4.1	M4.2
◪16	◪14	◪11	◪9	■19	■16	■17	■14	◪12	■12	■10	■9	■6	◪5

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E241M3	3	0.50	56.0	9	3.50	2.70	6	3	2.50	18.00
E241M4	4	0.70	63.0	12	4.50	3.40	6	3	3.30	21.00
E241M5	5	0.80	70.0	13	6.00	4.90	8	3	4.20	25.00
E241M6	6	1.00	80.0	15	6.00	4.90	8	3	5.00	30.00
E241M8	8	1.25	90.0	18	8.00	6.20	9	3	6.80	35.00
E241M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E241M12	12	1.75	110.0	23	9.00	7.00	10	4	10.30	–
E241M14	14	2.00	110.0	25	11.00	9.00	12	4	12.00	–
E241M16	16	2.00	110.0	25	12.00	9.00	12	4	14.00	–
E241M18	18	2.50	125.0	30	14.00	11.00	14	4	15.50	–
E241M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50	–

E471

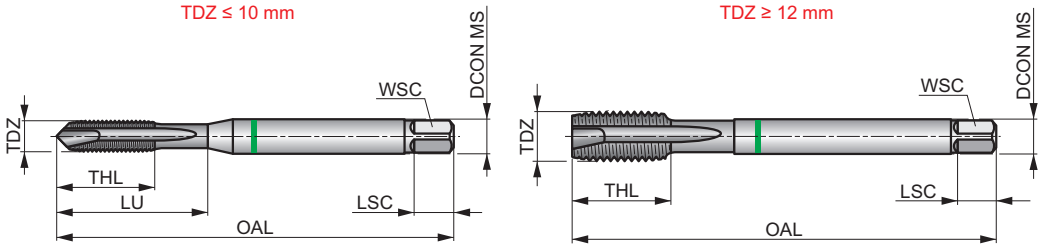
DORMER

Green SHARK Spiral Point Metric Machine Tap, DIN Standard

Through hole tap with reinforced or reduced shank for non-ferrous materials. Unique HSS-E-PM substrate with polished flutes to avoid chip sticking, provide consistency and process security.

SHARK

M	DIN 371/376	6H
	2.5×D	HSS-E PM
B 3.5-5		R
Bright		



Workpiece material group suitability and starting values for cutting speed (m/min).

P1.2	P1.3	P2.1	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.1
23	24	16	16	12	8	31	28	20	51	30	15	25

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E471M3	3	0.50	56.0	9	3.50	2.70	6	2	2.50	18.00
E471M4	4	0.70	63.0	12	4.50	3.40	6	2	3.30	21.00
E471M5	5	0.80	70.0	13	6.00	4.90	8	2	4.20	25.00
E471M6	6	1.00	80.0	15	6.00	4.90	8	3	5.00	30.00
E471M8	8	1.25	90.0	18	8.00	6.20	9	3	6.80	35.00
E471M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E471M12	12	1.75	110.0	23	9.00	7.00	10	3	10.30	–
E471M16	16	2.00	110.0	25	12.00	9.00	12	4	14.00	–
E471M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50	–

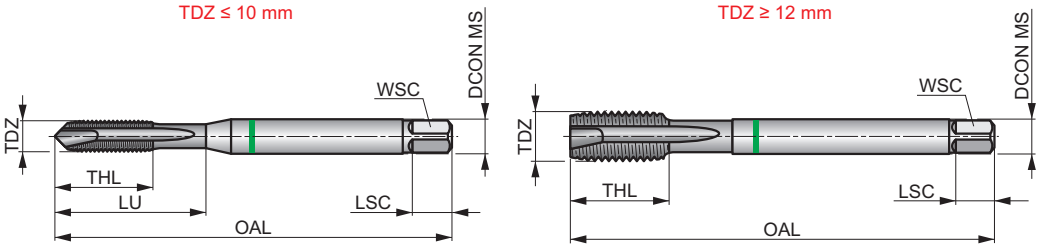
E472

DORMER

Green SHARK Spiral Point Metric Machine Tap, DIN Standard

High performance through hole tap with reinforced or reduced shank for non-ferrous materials. Unique HSS-E-PM substrate with Super-B coating to avoid chip sticking, providing superior performance, consistency and extended tool life.

SHARK



M	DIN 371/376	6H
2.5×D		HSS-E PM
B 3.5-5		R
Super B		

Workpiece material group suitability and starting values for cutting speed (m/min).

P1.1	P1.2	P1.3	P2.1	P2.2	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N4.1
◪34	◪38	◪40	◪29	◪24	◪35	◪26	■18	■46	■42	■30	◪76	■45	◪30

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E472M3	3	0.50	56.0	9	3.50	2.70	6	2	2.50	18.00
E472M4	4	0.70	63.0	12	4.50	3.40	6	2	3.30	21.00
E472M5	5	0.80	70.0	13	6.00	4.90	8	2	4.20	25.00
E472M6	6	1.00	80.0	15	6.00	4.90	8	3	5.00	30.00
E472M8	8	1.25	90.0	18	8.00	6.20	9	3	6.80	35.00
E472M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E472M12	12	1.75	110.0	23	9.00	7.00	10	3	10.30	–
E472M16	16	2.00	110.0	25	12.00	9.00	12	4	14.00	–
E472M20	20	2.50	140.0	30	16.00	12.00	15	4	17.50	–

E298

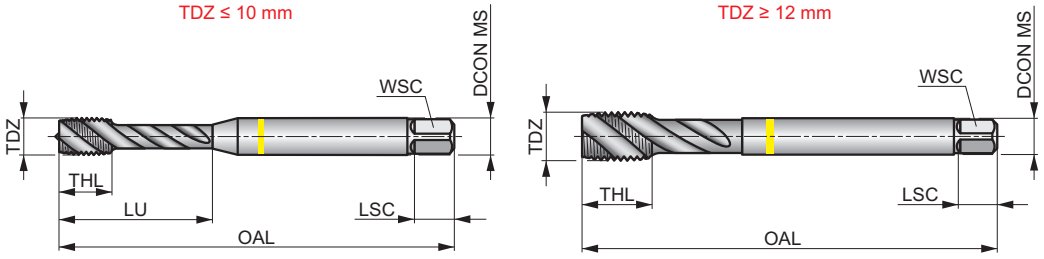
DORMER

Yellow SHARK 40° Spiral Flute Metric Machine Tap, DIN Standard

High performance blind hole tap for low carbon and alloyed steel and non-ferrous materials. Unique HSS-E-PM substrate with additional edge treatment to provide consistency and process security. Hard chrome coated to increase the surface hardness, reducing built-up edge and extend tool life.

SHARK

M	DIN 371/376	6H
	2×D	HSS-E PM
C 2-3		λ 40°
R	Cr	



Workpiece material group suitability and starting values for cutting speed (m/min).

P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P4.1	N3.1	N3.2	N3.3
■ 23	■ 25	■ 26	■ 19	■ 17	◪ 15	■ 14	◪ 11	◪ 8	■ 48	■ 28	◪ 14

Products from this series are also available in set with drills. Please see L114.

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD	LU
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(mm)
E298M3	3	0.50	56.0	6	3.50	2.70	6	3	2.50	18.00
E298M4	4	0.70	63.0	7	4.50	3.40	6	3	3.30	21.00
E298M5	5	0.80	70.0	8	6.00	4.90	8	3	4.20	25.00
E298M6	6	1.00	80.0	10	6.00	4.90	8	3	5.00	30.00
E298M8	8	1.25	90.0	12	8.00	6.20	9	3	6.80	35.00
E298M10	10	1.50	100.0	15	10.00	8.00	11	3	8.50	39.00
E298M12	12	1.75	110.0	16	9.00	7.00	10	3	10.30	–
E298M14	14	2.00	110.0	20	11.00	9.00	12	3	12.00	–
E298M16	16	2.00	110.0	20	12.00	9.00	12	4	14.00	–
E298M18	18	2.50	125.0	25	14.00	11.00	14	4	15.50	–
E298M20	20	2.50	140.0	25	16.00	12.00	15	4	17.50	–
E298M22	22	2.50	140.0	25	18.00	14.50	17	4	19.50	–
E298M24	24	3.00	160.0	30	18.00	14.50	17	4	21.00	–
E298M27	27	3.00	160.0	30	20.00	16.00	19	4	24.00	–
E298M30	30	3.50	160.0	36	22.00	18.00	21	4	26.50	–

E412

DORMER

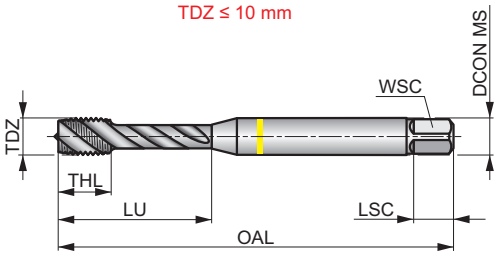
Yellow SHARK 48° Spiral Flute Metric Machine Tap, DIN Standard

High performance quick spiral tap for deep blind holes in medium strength steels. Unique HSS-E-PM substrate with TiAlN-Top coating and additional edge treatment provide superior performance. Extra back taper facilitates chip evacuation and reduces torque on reversal. Recommended for synchronous feed tap holders.

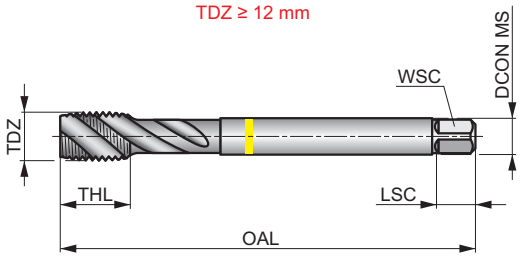
SHARK

M	DIN 371/376	6H
	3×D	HSS-E PM
C 2-3		λ 48°
R	TiAlN Top	

TDZ ≤ 10 mm



TDZ ≥ 12 mm



Workpiece material group suitability and starting values for cutting speed (m/min).

P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	M1.1	M1.2	M2.1
■ 46	■ 52	■ 54	■ 40	■ 35	■ 31	■ 24	■ 19	■ 16	■ 14	■ 12	◪ 19	◪ 16	◪ 17

M2.2	M3.1	M3.2	M3.3	M4.1	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1
◪ 14	◪ 12	◪ 10	◪ 9	◪ 6	◪ 16	◪ 12	◪ 8	◪ 54	◪ 48	◪ 35	◪ 60

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD	LU
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(mm)
E412M3	3	0.50	56.0	6	3.50	2.70	6	3	2.50	18.00
E412M4	4	0.70	63.0	7	4.50	3.40	6	3	3.30	21.00
E412M5	5	0.80	70.0	8	6.00	4.90	8	3	4.20	25.00
E412M6	6	1.00	80.0	10	6.00	4.90	8	3	5.00	30.00
E412M8	8	1.25	90.0	13	8.00	6.20	9	3	6.80	35.00
E412M10	10	1.50	100.0	15	10.00	8.00	11	3	8.50	39.00
E412M12	12	1.75	110.0	18	9.00	7.00	10	3	10.30	–
E412M14	14	2.00	110.0	20	11.00	9.00	12	3	12.00	–
E412M16	16	2.00	110.0	20	12.00	9.00	12	4	14.00	–
E412M20	20	2.50	140.0	25	16.00	12.00	15	4	17.50	–
E412M22	22	2.50	140.0	25	18.00	14.50	17	4	19.50	–
E412M24	24	3.00	160.0	30	18.00	14.50	17	4	21.00	–
E412M27	27	3.00	160.0	30	20.00	16.00	19	4	24.00	–
E412M30	30	3.50	180.0	36	22.00	18.00	21	4	26.50	–

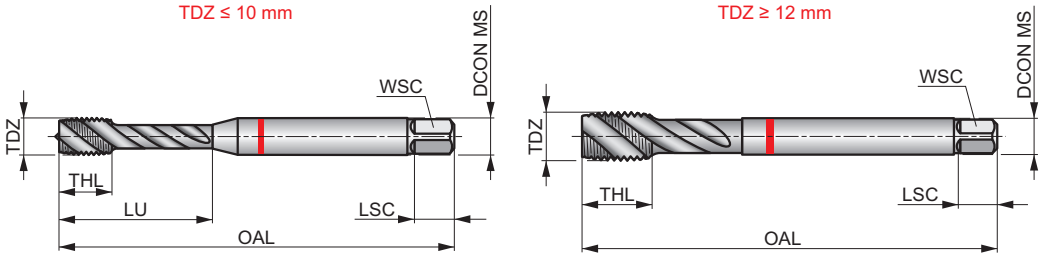
E260

Red SHARK 45° Spiral Flute Metric Machine Tap, DIN Standard

Blind hole tap with reinforced or reduced shank for medium to high strength steels. Unique HSS-E-PM substrate with bright surface finish. Extra back taper to further facilitate chip evacuation, preventing chipping on the last threads of the tap and also reduces torque when the tap reverses.

SHARK

M	DIN 371/376	6HX
2.5×D		HSS-E PM
C 2-3		λ 45°
R	Bright	



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	S1.2	S2.1	S3.1	S4.1
■10	■9	■7	■6	■5	■4	◪2	◪3	◪2	◪2

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E260M3	3	0.50	56.0	6	3.50	2.70	6	3	2.50	18.00
E260M4	4	0.70	63.0	7	4.50	3.40	6	3	3.30	21.00
E260M5	5	0.80	70.0	8	6.00	4.90	8	3	4.20	25.00
E260M6	6	1.00	80.0	10	6.00	4.90	8	3	5.00	30.00
E260M8	8	1.25	90.0	12	8.00	6.20	9	3	6.80	35.00
E260M10	10	1.50	100.0	15	10.00	8.00	11	3	8.50	39.00
E260M12	12	1.75	110.0	16	9.00	7.00	10	3	10.30	–
E260M14	14	2.00	110.0	20	11.00	9.00	12	3	12.00	–
E260M16	16	2.00	110.0	20	12.00	9.00	12	4	14.00	–
E260M20	20	2.50	140.0	25	16.00	12.00	15	4	17.50	–

E261

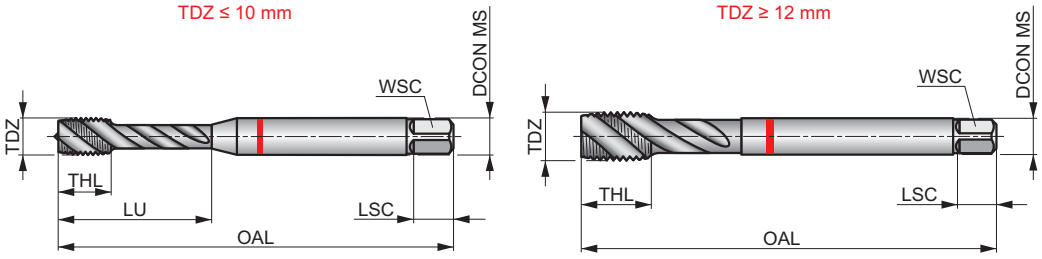
DORMER

Red SHARK 45° Spiral Flute Metric Machine Tap, DIN Standard

High performance blind hole tap for medium to high strength steels. Unique HSS-E-PM substrate with TiAlN-Top coating and additional edge treatment provide superior performance, consistency and extended tool life. Extra back taper further facilitates chip evacuation and reduces torque on tap reversal.

SHARK

M	DIN 371/376	6HX
	2.5×D	HSS-E PM
C 2-3		λ 45°
R	TiAlN Top	



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	S1.2	S2.1	S3.1	S4.1
■26	■24	■19	■16	■14	■12	◪9	◪2	◪3	◪2	◪2

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E261M3	3	0.50	56.0	6	3.50	2.70	6	3	2.50	18.00
E261M4	4	0.70	63.0	7	4.50	3.40	6	3	3.30	21.00
E261M5	5	0.80	70.0	8	6.00	4.90	8	3	4.20	25.00
E261M6	6	1.00	80.0	10	6.00	4.90	8	3	5.00	30.00
E261M8	8	1.25	90.0	12	8.00	6.20	9	3	6.80	35.00
E261M10	10	1.50	100.0	15	10.00	8.00	11	3	8.50	39.00
E261M12	12	1.75	110.0	16	9.00	7.00	10	3	10.30	–
E261M16	16	2.00	110.0	20	12.00	9.00	12	4	14.00	–
E261M20	20	2.50	140.0	25	16.00	12.00	15	4	17.50	–

E335

DORMER

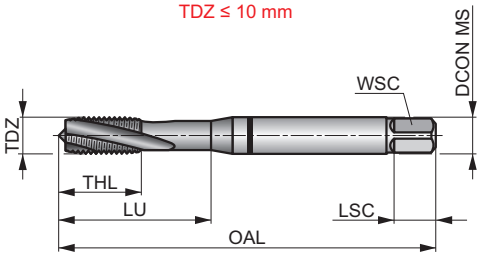
Black SHARK 15° Spiral Flute Metric Machine Tap, DIN Standard

High performance blind hole tap for efficient tapping in high strength steels and titanium alloys. A 15° slow spiral allows the chips to be pulled slightly upwards, yet without weakening the cutting edge, as higher spiral taps would. Unique HSS-E-PM substrate along with TiAlN-Top coating for superior performance.

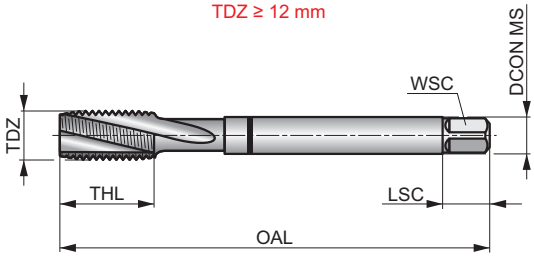
SHARK

M	DIN DORMER	6HX
	1.5×D	HSS-E PM
C 2-3		λ 15°
R	TiAlN Top	

TDZ ≤ 10 mm



TDZ ≥ 12 mm



Workpiece material group suitability and starting values for cutting speed (m/min).

P3.3	P4.2	P4.3	S1.2	S1.3	S3.1	S3.2	H3.1
■16	■12	■9	■12	■7	■4	■2	◪6

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E335M3	3	0.50	63.0	12	4.50	3.40	6	3	2.50	12.00
E335M4	4	0.70	70.0	13	6.00	4.90	8	3	3.30	13.00
E335M5	5	0.80	80.0	15	6.00	4.90	8	3	4.20	15.00
E335M6	6	1.00	90.0	18	8.00	6.20	9	3	5.00	18.00
E335M8	8	1.25	100.0	20	10.00	8.00	11	3	6.80	20.00
E335M10	10	1.50	100.0	20	10.00	8.00	11	3	8.50	39.00
E335M12	12	1.75	110.0	23	9.00	7.00	10	4	10.30	–

E238

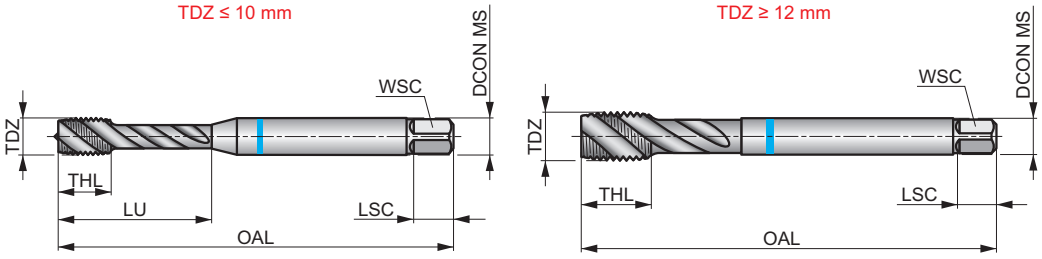
DORMER

Blue SHARK 40° Spiral Flute Metric Machine Tap, DIN Standard

Blind hole tap with reinforced or reduced shank for medium strength stainless steel. Unique HSS-E-PM substrate, along with additional edge treatment, provide consistency and process security. Steam tempered surface acts to retain cutting fluid and prevent chip to tool welding.

SHARK

M	DIN 371/376	6H
	2.5×D	HSS-E PM
C 2-3		λ 40°
R	ST	



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.3	P4.1	P4.2	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1
◪7	◪9	◪8	◪7	■10	■8	■9	■7	■7	■6	■5	■4

Products from this series are also available in set with drills. Please see L114.

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD	LU
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(mm)
E238M3	3	0.50	56.0	6	3.50	2.70	6	3	2.50	18.00
E238M4	4	0.70	63.0	7	4.50	3.40	6	3	3.30	21.00
E238M5	5	0.80	70.0	8	6.00	4.90	8	3	4.20	25.00
E238M6	6	1.00	80.0	10	6.00	4.90	8	3	5.00	30.00
E238M8	8	1.25	90.0	12	8.00	6.20	9	3	6.80	33.00
E238M10	10	1.50	100.0	15	10.00	8.00	11	3	8.50	39.00
E238M12	12	1.75	110.0	16	9.00	7.00	10	4	10.30	–
E238M14	14	2.00	110.0	20	11.00	9.00	12	4	12.00	–
E238M16	16	2.00	110.0	20	12.00	9.00	12	4	14.00	–
E238M18	18	2.50	125.0	25	14.00	11.00	14	4	15.50	–
E238M20	20	2.50	140.0	25	16.00	12.00	15	4	17.50	–
E238M22	22	2.50	140.0	25	18.00	14.50	17	4	19.80	–
E238M24	24	3.00	160.0	30	18.00	14.50	17	4	21.00	–
E238M27	27	3.00	160.0	30	20.00	16.00	19	4	24.00	–
E238M30	30	3.50	180.0	36	22.00	18.00	21	4	26.50	–

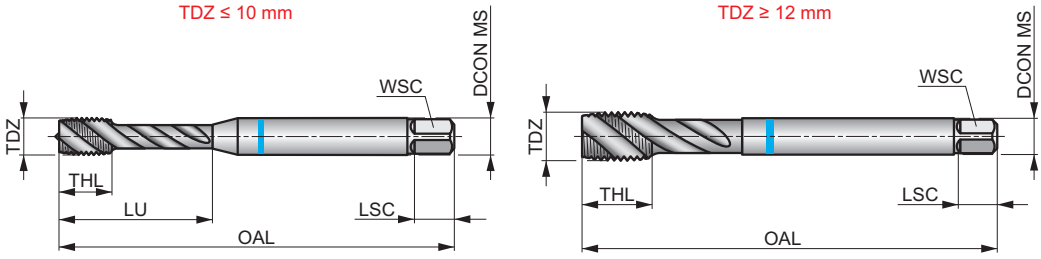
E239

Blue SHARK 40° Spiral Flute Metric Machine Tap, DIN Standard

High performance blind hole tap for medium strength stainless steel. Unique HSS-E-PM substrate with Super-B coating and additional edge treatment providing superior performance, consistency and extended tool life. Back taper on spiral flute taps facilitates chip evacuation and reduces torque when the tap reverses.

SHARK

M	DIN 371/376	6H
2.5×D		HSS-E PM
C 2-3		λ 40°
R	Super B	



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.3	P4.1	P4.2	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3	M4.1	M4.2
◪15	◪13	◪10	◪8	■18	■15	■16	■13	◪11	■11	■9	■8	■5	◪4

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E239M3	3	0.50	56.0	6	3.50	2.70	6	3	2.50	18.00
E239M4	4	0.70	63.0	7	4.50	3.40	6	3	3.30	21.00
E239M5	5	0.80	70.0	8	6.00	4.90	8	3	4.20	25.00
E239M6	6	1.00	80.0	10	6.00	4.90	8	3	5.00	30.00
E239M8	8	1.25	90.0	12	8.00	6.20	9	3	6.80	33.00
E239M10	10	1.50	100.0	15	10.00	8.00	11	3	8.50	39.00
E239M12	12	1.75	110.0	16	9.00	7.00	10	4	10.30	–
E239M14	14	2.00	110.0	20	11.00	9.00	12	4	12.00	–
E239M16	16	2.00	110.0	20	12.00	9.00	12	4	14.00	–
E239M20	20	2.50	140.0	25	16.00	12.00	15	4	17.50	–

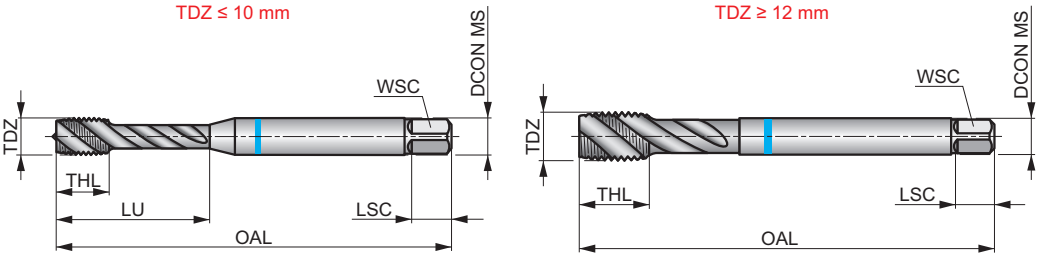
E414

DORMER

Blue SHARK 48° Spiral Flute Metric Machine Tap, DIN Standard

High performance quick spiral tap for deep blind holes in stainless steels. Unique HSS-E-PM substrate with Super-B coating and additional edge treatment provide superior performance. Extra back taper facilitates chip evacuation and reduces torque on reversal. Recommended to be used with synchronous feed tap holders.

SHARK



M	DIN 371/376	6H
	3×D	HSS-E PM
C 2-3		λ 48°
R	Super B	

Workpiece material group suitability and starting values for cutting speed (m/min).

P2.2	P2.3	P3.2	P3.3	P4.1	P4.2	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3	M4.1	M4.2
◪32	◪28	◪15	◪13	◪11	◪10	■22	■19	■20	■16	■13	■14	■12	■11	■8	■7

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E414M3	3	0.50	56.0	6	3.50	2.70	6	3	2.50	18.00
E414M4	4	0.70	63.0	7	4.50	3.40	6	3	3.30	21.00
E414M5	5	0.80	70.0	8	6.00	4.90	8	3	4.20	25.00
E414M6	6	1.00	80.0	10	6.00	4.90	8	3	5.00	30.00
E414M8	8	1.25	90.0	13	8.00	6.20	9	3	6.80	35.00
E414M10	10	1.50	100.0	15	10.00	8.00	11	3	8.50	39.00
E414M12	12	1.75	110.0	18	9.00	7.00	10	3	10.30	–
E414M14	14	2.00	110.0	20	11.00	9.00	12	3	12.00	–
E414M16	16	2.00	110.0	20	12.00	9.00	12	4	14.00	–
E414M20	20	2.50	140.0	25	16.00	12.00	15	4	17.50	–

E473

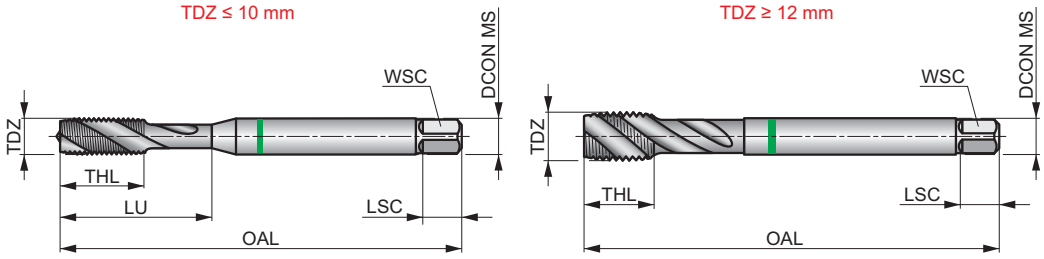
DORMER

Green SHARK 35° Spiral Flute Metric Machine Tap, DIN Standard

Blind hole tap with reinforced or reduced shank for non-ferrous materials. Unique HSS-E-PM substrate with polished flutes provide consistency and process security.

SHARK

M	DIN 371/376	6H
2.5×D		HSS-E PM
C 2-3		λ 35°
R	Bright	



Workpiece material group suitability and starting values for cutting speed (m/min).

P1.2	P1.3	P2.1	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.1
◪22	◪23	◪15	■15	■11	■7	■29	■27	■19	■48	■28	◪14	■24

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E473M3	3	0.50	56.0	9	3.50	2.70	6	2	2.50	18.00
E473M4	4	0.70	63.0	12	4.50	3.40	6	2	3.30	21.00
E473M5	5	0.80	70.0	13	6.00	4.90	8	2	4.20	25.00
E473M6	6	1.00	80.0	15	6.00	4.90	8	2	5.00	30.00
E473M8	8	1.25	90.0	18	8.00	6.20	9	2	6.80	35.00
E473M10	10	1.50	100.0	20	10.00	8.00	11	2	8.50	39.00
E473M12	12	1.75	110.0	23	9.00	7.00	10	3	10.30	–
E473M16	16	2.00	110.0	25	12.00	9.00	12	3	14.00	–
E473M20	20	2.50	140.0	30	16.00	12.00	15	3	17.50	–

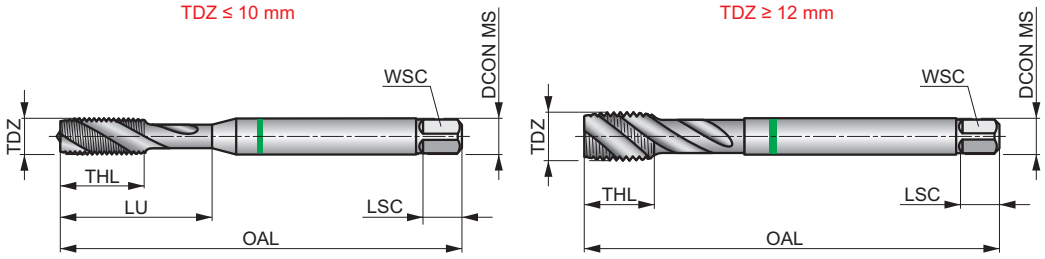
E474

Green SHARK 35° Spiral Flute Metric Machine Tap, DIN Standard

High performance blind hole tap with reinforced or reduced shank for non-ferrous materials. Unique HSS-E-PM substrate with Super-B to avoid chip sticking, providing superior performance, consistency and extended tool life.

SHARK

M	DIN 371/376	6H
	2.5×D	HSS-E PM
C 2-3		λ 35°
R	Super B	



Workpiece material group suitability and starting values for cutting speed (m/min).

P1.1	P1.2	P1.3	P2.1	P2.2	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N4.1
◪32	◪36	◪38	◪27	◪22	◪33	◪24	■17	■44	■40	■28	◪72	■43	◪28

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)	LU (mm)
E474M3	3	0.50	56.0	9	3.50	2.70	6	2	2.50	18.00
E474M4	4	0.70	63.0	12	4.50	3.40	6	2	3.30	21.00
E474M5	5	0.80	70.0	13	6.00	4.90	8	2	4.20	25.00
E474M6	6	1.00	80.0	15	6.00	4.90	8	2	5.00	30.00
E474M8	8	1.25	90.0	18	8.00	6.20	9	2	6.80	35.00
E474M10	10	1.50	100.0	20	10.00	8.00	11	2	8.50	39.00
E474M12	12	1.75	110.0	23	9.00	7.00	10	3	10.30	–
E474M16	16	2.00	110.0	25	12.00	9.00	12	3	14.00	–
E474M20	20	2.50	140.0	30	16.00	12.00	15	3	17.50	–

E299

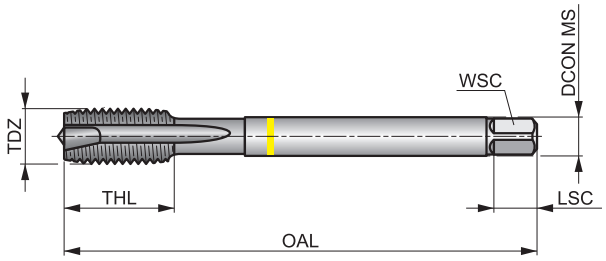
DORMER

Yellow SHARK Spiral Point Metric-Fine Machine Tap, DIN Standard

High performance through hole tap for low carbon and alloyed steel and non-ferrous materials. Unique HSS-E-PM substrate with additional edge treatment, provide consistency and process security. Hard chrome coated to increase the surface hardness and reduce built-up edge, increasing performance and tool life.

SHARK

MF	DIN 374	6H
2.5×D		HSS-E PM
B 3.5-5		R
Cr		



Workpiece material group suitability and starting values for cutting speed (m/min).

P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P4.1	N3.1	N3.2	N3.3
■24	■27	■28	■20	■18	◪16	■15	◪12	◪9	■51	■30	◪15

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)
E299M4X.5	4	0.50	63.0	12	2.80	2.10	5	3	3.50
E299M5X.5	5	0.50	70.0	13	3.50	2.70	6	3	4.50
E299M6X.75	6	0.75	80.0	15	4.50	3.40	6	3	5.30
E299M8X.75	8	0.75	80.0	15	6.00	4.90	8	3	7.30
E299M8X1.0	8	1.00	90.0	18	6.00	4.90	8	3	7.00
E299M10X.75	10	0.75	90.0	20	7.00	5.50	8	3	9.30
E299M10X1.0	10	1.00	90.0	20	7.00	5.50	8	3	9.00
E299M10X1.25	10	1.25	100.0	20	7.00	5.50	8	3	8.80
E299M12X1.0	12	1.00	100.0	21	9.00	7.00	10	4	11.00
E299M12X1.25	12	1.25	100.0	21	9.00	7.00	10	4	10.80
E299M12X1.5	12	1.50	110.0	21	9.00	7.00	10	4	10.50
E299M14X1.0	14	1.00	100.0	21	11.00	9.00	12	4	13.00
E299M14X1.25	14	1.25	100.0	21	11.00	9.00	12	4	12.80
E299M14X1.5	14	1.50	100.0	21	11.00	9.00	12	4	12.50
E299M16X1.0	16	1.00	100.0	21	12.00	9.00	12	4	15.00
E299M16X1.5	16	1.50	100.0	21	12.00	9.00	12	4	14.50
E299M18X1.0	18	1.00	110.0	24	14.00	11.00	14	4	17.00
E299M18X1.5	18	1.50	110.0	24	14.00	11.00	14	4	16.50
E299M20X1.5	20	1.50	125.0	24	16.00	12.00	15	4	18.50
E299M22X1.5	22	1.50	125.0	25	18.00	14.50	17	4	20.50
E299M24X1.5	24	1.50	140.0	28	18.00	14.50	17	4	22.50
E299M24X2.0	24	2.00	140.0	28	18.00	14.50	17	4	22.00
E299M27X2.0	27	2.00	140.0	28	20.00	16.00	19	4	25.00
E299M30X2.0	30	2.00	150.0	28	22.00	18.00	21	4	28.00

E384

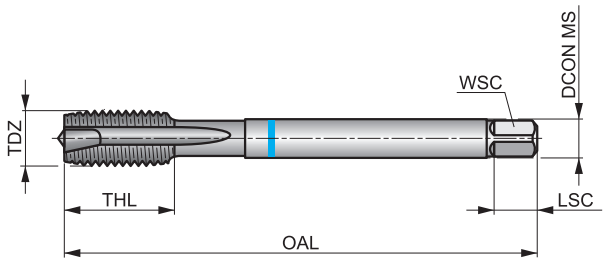
DORMER

Blue SHARK Spiral Point Metric-Fine Machine Tap, DIN Standard

Through hole tap with reinforced or reduced shank for medium strength stainless steel. Unique HSS-E-PM substrate along with additional edge treatment, provide consistency and process security. Steam tempered surface acts to retain cutting fluid and prevent chip to tool welding.

SHARK

MF	DIN 374	6H
	2.5×D	HSS-E PM
B 3.5-5		R
ST		



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2
◪8	◪15	◪12	◪10	◪9	◪7	◪6	■11	■9	■10	■8	◪7	■8	■7

M3.3	M4.1	M4.2
■6	■5	◪4

Product	TDZ	TP	OAL	THL	DCON MS	WSC	LSC	NOF	PHD
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)
E384M6X.75	6	0.75	80.0	15	4.50	3.40	6	3	5.30
E384M8X1.0	8	1.00	90.0	18	6.00	4.90	8	3	7.00
E384M10X1.0	10	1.00	90.0	20	7.00	5.50	8	3	9.00
E384M10X1.25	10	1.25	100.0	20	7.00	5.50	8	3	8.80
E384M12X1.0	12	1.00	100.0	21	9.00	7.00	10	4	11.00
E384M12X1.25	12	1.25	100.0	21	9.00	7.00	10	4	10.80
E384M12X1.5	12	1.50	100.0	21	9.00	7.00	10	4	10.50
E384M14X1.5	14	1.50	100.0	21	11.00	9.00	12	4	12.50
E384M16X1.5	16	1.50	100.0	21	12.00	9.00	12	5	14.50
E384M18X1.5	18	1.50	110.0	24	14.00	11.00	14	5	16.50
E384M20X1.5	20	1.50	125.0	24	16.00	12.00	15	5	18.50

E300

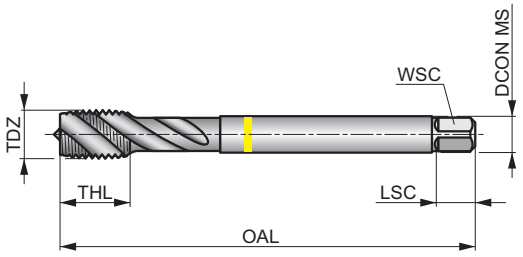
DORMER

Yellow SHARK 40° Spiral Flute Metric-Fine Machine Tap, DIN Standard

High performance blind hole tap for low carbon and alloyed steel and non-ferrous materials. Unique HSS-E-PM substrate with additional edge treatment, provide consistency and process security. Hard chrome coated to increase the surface hardness, reduces built-up edge, resulting in increased performance and tool life.

SHARK

MF	DIN 374	6H
	2×D	HSS-E PM
C 2-3		λ 40°
R	Cr	



Workpiece material group suitability and starting values for cutting speed (m/min).

P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P4.1	N3.1	N3.2	N3.3
■23	■25	■26	■19	■17	◪15	■14	◪11	◪8	■48	■28	◪14

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)
E300M4X.5	4	0.50	63.0	6.5	2.80	2.10	5	3	3.50
E300M5X.5	5	0.50	70.0	7.5	3.50	2.70	6	3	4.50
E300M6X.75	6	0.75	80.0	10	4.50	3.40	6	3	5.30
E300M8X.75	8	0.75	80.0	13	6.00	4.90	8	3	7.30
E300M8X1.0	8	1.00	90.0	13	6.00	4.90	8	3	7.00
E300M10X.75	10	0.75	90.0	13	7.00	5.50	8	3	9.30
E300M10X1.0	10	1.00	90.0	12	7.00	5.50	8	3	9.00
E300M10X1.25	10	1.25	100.0	15	7.00	5.50	8	3	8.80
E300M12X1.0	12	1.00	100.0	15	9.00	7.00	10	4	11.00
E300M12X1.25	12	1.25	100.0	13	9.00	7.00	10	4	10.80
E300M12X1.5	12	1.50	100.0	13	9.00	7.00	10	4	10.50
E300M14X1.0	14	1.00	100.0	15	11.00	9.00	12	4	13.00
E300M14X1.25	14	1.25	100.0	15	11.00	9.00	12	4	12.80
E300M14X1.5	14	1.50	100.0	15	11.00	9.00	12	4	12.50
E300M16X1.0	16	1.00	100.0	15	12.00	9.00	12	5	15.00
E300M16X1.5	16	1.50	100.0	15	12.00	9.00	12	5	14.50
E300M18X1.0	18	1.00	110.0	17	14.00	11.00	14	5	17.00
E300M18X1.5	18	1.50	110.0	17	14.00	11.00	14	5	16.50
E300M20X1.5	20	1.50	125.0	17	16.00	12.00	15	5	18.50
E300M22X1.5	22	1.50	125.0	17	18.00	14.50	17	5	20.50
E300M24X1.5	24	1.50	140.0	20	18.00	14.50	17	5	22.50
E300M24X2.0	24	2.00	140.0	20	18.00	14.50	17	5	22.00
E300M27X2.0	27	2.00	140.0	20	20.00	16.00	19	5	25.00
E300M30X2.0	30	2.00	150.0	20	22.00	18.00	21	5	28.00

E383

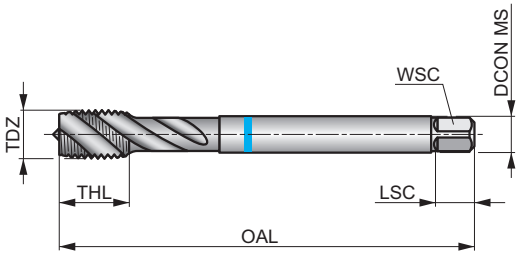
DORMER

Blue SHARK 40° Spiral Flute Metric-Fine Machine Tap, DIN Standard

Blind hole tap with reduced shank for medium strength stainless steel. Unique HSS-E-PM substrate along with additional edge treatment, provide consistency and process security. Steam tempered surface acts to retain cutting fluid and prevent chip to tool welding.

SHARK

MF	DIN 374	6H
	2×D	HSS-E PM
C 2-3		λ 40°
R	ST	



Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.3	P4.1	P4.2	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1
◪7	◪9	◪8	◪7	■10	■8	■9	■7	■7	■6	■5	■4

Product	TDZ	TP (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)
E383M6X.75	6	0.75	80.0	10	4.50	3.40	6	3	5.30
E383M8X1.0	8	1.00	90.0	13	6.00	4.90	8	3	7.00
E383M10X1.0	10	1.00	90.0	12	7.00	5.50	8	3	9.00
E383M10X1.25	10	1.25	100.0	15	7.00	5.50	8	3	8.80
E383M12X1.0	12	1.00	100.0	13	9.00	7.00	10	4	11.00
E383M12X1.25	12	1.25	100.0	13	9.00	7.00	10	4	10.80
E383M12X1.5	12	1.50	100.0	13	9.00	7.00	10	4	10.50
E383M14X1.5	14	1.50	100.0	21	11.00	9.00	12	4	12.50
E383M16X1.5	16	1.50	100.0	21	12.00	9.00	12	5	14.50
E383M18X1.5	18	1.50	110.0	24	14.00	11.00	14	5	16.50
E383M20X1.5	20	1.50	125.0	24	16.00	12.00	15	5	18.50

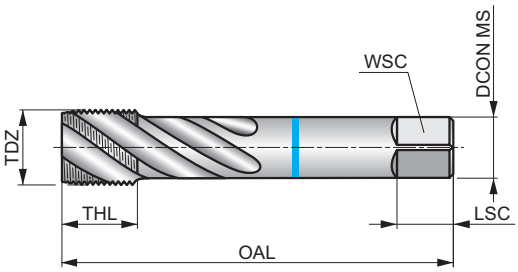
E382

DORMER

Blue SHARK 40° Spiral Flute G(BSP) Machine Tap, DIN Standard

Blind hole tap with reduced shank for medium strength stainless steel. Unique HSS-E-PM substrate along with additional edge treatment, provide consistency and process security. Steam tempered surface acts to retain cutting fluid and prevent chip to tool welding.

SHARK



G	DIN 5156	Normal
	2×D	HSS-E PM
C 2-3		λ 40°
R	ST	

Workpiece material group suitability and starting values for cutting speed (m/min).

P2.3	P3.3	P4.1	P4.2	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1
◪8	◪10	◪9	◪7	■10	■8	■9	■7	■7	■6	■5	■4

Product	TDZ	TPI	TD (mm)	OAL (mm)	THL (mm)	DCON MS (mm)	WSC (mm)	LSC (mm)	NOF	PHD (mm)
E3821/8	1/8	28	9.730	90.0	12	7.00	5.50	8	3	8.80
E3821/4	1/4	19	13.160	100.0	15	11.00	9.00	12	4	11.80
E3823/8	3/8	19	16.660	100.0	15	12.00	9.00	12	4	15.25
E3821/2	1/2	14	20.960	125.0	24	16.00	12.00	15	4	19.00
E3823/4	3/4	14	26.440	140.0	20	20.00	16.00	19	4	24.50
E3821	1"	11	33.250	160.0	24	25.00	20.00	23	4	30.75

L114

Set of EP/EX or Shark Line Taps with A002 or A108 Drills

Plastic box with 7 machine taps and corresponding drills. Either with spiral point taps for through holes only Nr.301 with bright finish, Nr.303 Yellow Shark with hard-chrome coating or Nr.305 Blue Shark for stainless steel. Spiral flute taps for blind holes Nr.302 with bright finish, Nr.304 Yellow Shark or Nr.306 Blue Shark.

Nr. = Set number, A = Styles in Set, B = No. in Set, C = Tap diameters in Set, D = Drill diameters in Set.

Product	Nr.	A	B	C	D
L114303	Nr.303	E297 + A002	14	E297M3, E297M4, E297M5, E297M6, E297M8, E297M10, E297M12	A0022.5, A0023.3, A0024.2, A0025.0, A0026.8, A0028.5, A00210.2
L114304	Nr.304	E298 + A002	14	E298M3, E298M4, E298M5, E298M6, E298M8, E298M10, E298M12	A0022.5, A0023.3, A0024.2, A0025.0, A0026.8, A0028.5, A00210.2
L114305	Nr.305	E238 + A108	14	E238M3, E238M4, E238M5, E238M6, E238M8, E238M10, E238M12	A1082.5, A1083.3, A1084.2, A1085.0, A1086.8, A1088.5, A10810.2
L114306	Nr.306	E240 + A108	14	E240M3, E240M4, E240M5, E240M6, E240M8, E240M10, E240M12	A1082.5, A1083.3, A1084.2, A1085.0, A1086.8, A1088.5, A10810.2

M200-1

M200 no. 1 Blue, Cutting Fluid for Heavy Machining

A high performance cutting oil for difficult operations, such as tapping, broaching and drilling by hand or with a pillar drill. For increased tool life and improved surface finishes. First choice recommendation for high strength steel, stainless steel and super alloys.

Product	Nr.
M2000.25NR.1BLUE	1/4 Ltr. 12×
M2001.0NR.1BLUE	1 Ltr.
M2005.0NR.1BLUE	5 Ltr.
M20020.0NR.1BLUE	20 Ltr.

M200-2

M200 no. 2 Red, Cutting Fluid for Non-Ferrous Metals

A neat oil for machining operations requiring chip removal in aluminium and its alloys. For lubrication and cooling to promote long tool life and ensure excellent surface finish. Low impact on the environment due to excellent anti-mist properties, high oxidation stability and low odours.

Product	Nr.
M2000.25NR.2RED	1/4 Ltr. 12×
M2001.0NR.2RED	1 Ltr.
M2005.0NR.2RED	5 Ltr.

M200-3

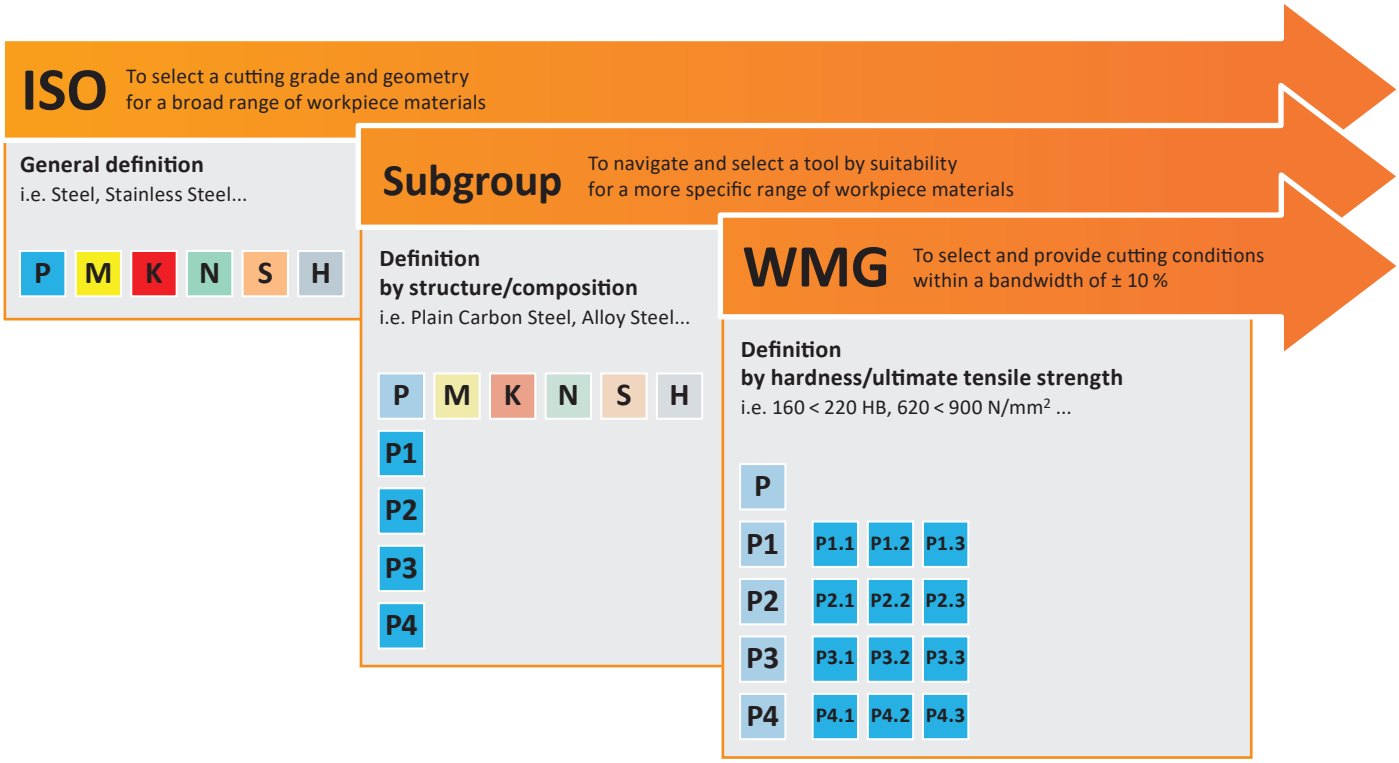
M200 no. 3 Green, Cutting Fluid for General Purpose Machining

A high performance cutting oil with extreme pressure (EP) additives to provide longer tool life. For general cutting or forming operations, such as tapping, broaching and drilling in steel or cast steel and stainless steel.

Product	Nr.
M2000.25NR.3GREEN	1/4 Ltr. 12×
M2001.0NR.3GREEN	1 Ltr.
M2005.0NR.3GREEN	5 Ltr.

GENERAL TECHNICAL INFORMATION

WORKPIECE MATERIAL GROUPS (WMG)



ABOUT DORMER PRAMET'S WORKPIECE MATERIAL CLASSIFICATION

Workpiece **M**aterial **G**roups (**WMG**) are used to support easy and reliable selection of the right cutting tool and starting values for machining conditions in particular applications.

Dormer Pramet classifies workpiece materials into six different coloured groups:

- **Blue**: Steel and cast steel (P-group)
- **Yellow**: Stainless steel (M-group)
- **Red**: Cast iron (K-group)
- **Green**: Non-ferrous metals (N-group)
- **Brown**: High-temperature alloys (S-group)
- **Grey**: Hardened materials (H-group)

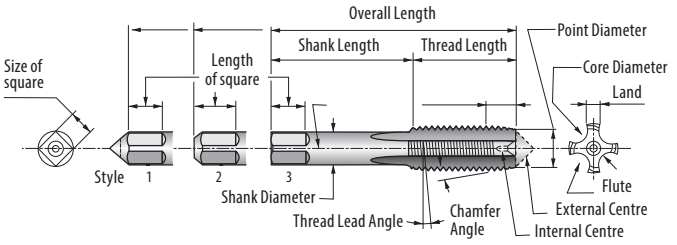
Each of these are divided into subgroups on the basis of their structure and/or composition. For example, P-group steel and cast steel is split into four subgroups, namely:

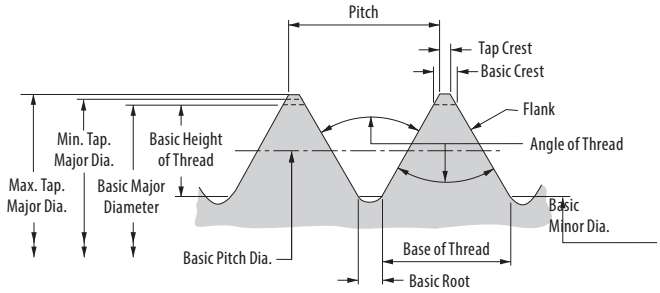
- **P1** – Free machining steel
- **P2** – Plain carbon steel
- **P3** – Alloy steel
- **P4** – Tool steel

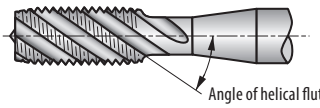
A final division includes material properties, such as hardness and ultimate tensile strength. This is to provide our customers with a complete tool recommendation, including starting values for cutting speed and feed.

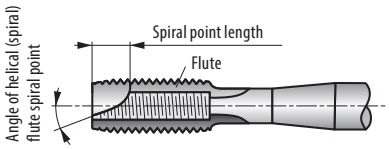
The table on the next page includes a description of each workpiece material group, as well as examples of commonly used designations.

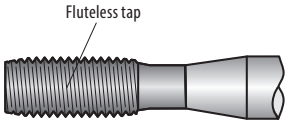
ISO group		WMG (Work Material Group)			Hardness (HB or HRC)	Ultimate Tensile Strength (MPa)
P	P1	P1.1	Free machining steel (carbon steels with increased machinability)	Sulfurized	< 240 HB	≤ 830
		P1.2		Sulfurized and phosphorized	< 180 HB	≤ 620
		P1.3		Sulfurized/phosphorized and leaded	< 180 HB	≤ 620
	P2	P2.1	Plain carbon steel (steels comprised of mainly iron and carbon)	Containing <0.25 % C	< 180 HB	≤ 620
		P2.2		Containing <0.55 % C	< 240 HB	≤ 830
		P2.3		Containing >0.55 % C	< 300 HB	≤ 1030
	P3	P3.1	Alloy steel (carbon steels with an alloying content ≤ 10%)	Annealed	< 180 HB	≤ 620
		P3.2		Hardened and tempered	180 – 260 HB	> 620 ≤ 900
		P3.3			260 – 360 HB	> 900 ≤ 1240
	P4	P4.1	Tool steel (special alloy steel for tools, dies and molds)	Annealed	< 26 HRC	≤ 900
		P4.2		Hardened and tempered	26 – 39 HRC	> 900 ≤ 1240
		P4.3			39 – 45 HRC	> 1240 ≤ 1450
M	M1	M1.1	Ferritic stainless steel (straight chromium non-hardenable alloys)		< 160 HB	≤ 520
		M1.2			160 – 220 HB	> 520 ≤ 700
	M2	M2.1	Martensitic stainless steel (straight chromium hardenable alloys)	Annealed	< 200 HB	≤ 670
		M2.2		Quenched and tempered	200 – 280 HB	> 670 ≤ 950
		M2.3		Precipitation-hardened	280 – 380 HB	> 950 ≤ 1300
	M3	M3.1	Austenitic stainless steel (chromium-nickel and chromium-nickel-manganese alloys)		< 200 HB	≤ 750
		M3.2			200 – 260 HB	> 750 ≤ 870
		M3.3			260 – 300 HB	> 870 ≤ 1040
	M4	M4.1	Austenitic-ferritic (DUPLEX) or super-austenitic stainless steel		< 300 HB	≤ 990
		M4.2	Precipitation hardening austenitic stainless steel		300 – 380 HB	≤ 1320
K	K1	K1.1	Gray iron or Automotive Gray iron (GG) (iron-carbon castings with a lamellar graphite microstructure)	Ferritic or ferritic-pearlitic	< 180 HB	≤ 190
		K1.2		Ferritic-pearlictic or pearlitic	180 – 240 HB	> 190 ≤ 310
		K1.3		Pearlitic	240 – 280 HB	> 310 ≤ 390
	K2	K2.1	Malleable iron (GTS/GTW) (iron-carbon castings with a graphite-free microstructure)	Ferritic	< 160 HB	≤ 400
		K2.2		Ferritic or pearlitic	160 – 200 HB	> 400 ≤ 550
		K2.3		Pearlitic	200 – 240 HB	> 550 ≤ 660
	K3	K3.1	Ductile iron (GGG) (iron-carbon castings with a nodular graphite microstructure)	Ferritic	< 180 HB	≤ 560
		K3.2		Ferritic or pearlitic	180 – 220 HB	> 560 ≤ 680
		K3.3		Pearlitic	220 – 260 HB	> 680 ≤ 800
	K4	K4.1	Austenitic gray iron (ASTM A436) (iron-carbon alloy castings with an austenitic lamellar graphite microstructure)		< 180 HB	≤ 190
		K4.2	Austenitic ductile iron (ASTM A439 or ASTM A571) (iron-carbon alloy castings with an austenitic nodular graphite microstructure)		< 240 HB	≤ 740
		K4.3	Austempered ductile iron (ASTM A897) (iron-carbon alloy castings with an ausferrite microstructure)		< 280 HB	> 840 ≤ 980
		K4.4			280 – 320 HB	> 980 ≤ 1130
		K4.5			320 – 360 HB	> 1130 ≤ 1280
	K5	K5.1	Compacted graphite iron CGI (ASTM A842) (iron-carbon castings with a vermicular graphite structure)	Ferritic	< 180 HB	≤ 400
		K5.2		Ferritic-pearlitic	180 – 220 HB	> 400 ≤ 450
		K5.3		Pearlitic	220 – 260 HB	> 450 ≤ 500
N	N1	N1.1	Commercially pure wrought aluminium		< 60 HB	≤ 240
		N1.2	Wrought aluminium alloys	Half hard tempered	60 – 100 HB	> 240 ≤ 400
		N1.3		Full hard tempered	100 – 150 HB	> 400 ≤ 590
	N2	N2.1	Cast aluminium alloys		< 75 HB	≤ 240
		N2.2			75 – 90 HB	> 240 ≤ 270
		N2.3			90 – 140 HB	> 270 ≤ 440
	N3	N3.1	Free-cutting copper-alloys materials with excellent machining properties		–	–
		N3.2	Short-chip copper-alloys with good to moderate machining properties		–	–
		N3.3	Electrolytic copper and long-chip copper-alloys with moderate to poor machining properties		–	–
	N4	N4.1	Thermoplastic polymers		–	–
		N4.2	Thermosetting polymers		–	–
		N4.3	Reinforced polymers or composites		–	–
	N5	N5.1	Graphite		–	–
S	S1	S1.1	Titanium or titanium alloys		< 200 HB	≤ 660
		S1.2			200 – 280 HB	> 660 ≤ 950
		S1.3			280 – 360 HB	> 950 ≤ 1200
	S2	S2.1	Fe-based high-temperature alloys		< 200 HB	≤ 690
		S2.2			200 – 280 HB	> 690 ≤ 970
	S3	S3.1	Ni-based high-temperature alloys		< 280 HB	≤ 940
		S3.2			280 – 360 HB	> 940 ≤ 1200
	S4	S4.1	Co-based high-temperature alloys		< 240 HB	≤ 800
		S4.2			240 – 320 HB	> 800 ≤ 1070
H	H1	H1.1	Chilled cast iron		< 440 HB	–
	H2	H2.1	Hardened cast iron		< 55 HRC	–
		H2.2			> 55 HRC	–
	H3	H3.1	Hardened steel < 55 HRC		< 51 HRC	–
		H3.2			51 – 55 HRC	–
	H4	H4.1	Hardened steel > 55 HRC		55 – 59 HRC	–
		H4.2			> 59 HRC	–

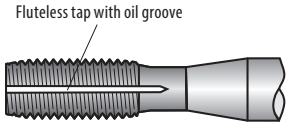












Allowance: The minimum clearance or maximum interference which is intended between mating parts.

Angle of Thread: The angle included between the flanks of a thread measured in an axial plane.

Back Taper: A slight taper on the threaded portion of the tap making the pitch diameter near the shank smaller than that at the chamfer.

Basic: The theoretical or nominal standard size from which all variations are made.

Chamfer: The tapered and relieved cutting teeth at the front end of the threaded section. Common types of chamfer are taper, 8 to 10 pitches long, plug, 3 to 5 pitches and bottoming, 1 to 2 pitches.

Crest: The top surface joining the two sides or flanks of a thread.

Cutting Face: The leading side of the land.

Flute: The longitudinal channels formed on a tap to create cutting edges on the thread profile.

Heel: The following side of the land.

Height of Thread: In profile, distance between crest and bottom section of thread measured normal to the axis.

Hook Face: A concave cutting face of the land. This may be varied for different materials and conditions.

Interrupted Thread: Alternate teeth are removed in the thread helix on a tap; usually restricted to those having an odd number of flutes.

Land: One of the threaded sections between the flutes of a tap.

Lead of Thread: The distance a screw thread advances axially in one turn.

Major Diameter: The largest diameter of the screw or nut on a straight screw thread.

Minor Diameter: The smallest diameter of the screw or nut on a straight screw thread.

Neck: The reduced diameter, on some taps, between the threaded portion and the shank.

Pitch: The distance from a point on one thread to a corresponding point on the next thread, measured parallel to the axis.

Pitch Diameter: On a straight screw thread, the diameter of an imaginary cylinder where the width of the thread and the width of the space between threads is equal.

Point Diameter: The diameter at the leading end of the chamfered portion.

Radial: The straight face of a land, the plane of which passes through the axis of the tap.

Rake: The angle of the cutting face of the land in relation to an axial plane intersecting the cutting face at the major diameter.

Relief: The removal of metal behind the cutting edge to provide clearance between the part being threaded and a portion of the threaded land. Also, see back taper.

Chamfer relief: The gradual decrease in land height from cutting edge to heel on the chamfered portion of the tap land to provide radial clearance for the cutting edge.

Concentric relief: Radial relief in the thread form starting at the back of a concentric margin.

Eccentric thread relief: Radial relief in the thread form starting at the cutting edge and continuing to the heel.

Root: The bottom surface joining the flanks of two adjacent threads.

Side or flank of thread: The surface of the thread which connects the crest with the root.

Shank: The portion of the tap by which it is held and driven.

Spiral Point: An oblique cutting edge ground into the lands to provide a shear cutting action on the first few threads.

Square: The squared end of the tap shank.

Thread: The helical formed tooth of the tap which produces the thread in a tapped hole.

Thread Lead Angle: The angle made by the helix of the thread at the pitch diameter, with a plane perpendicular to the axis.

Threads Per Inch: The number of threads in one inch of length.

THREAD: Single: A thread in which lead is equal to pitch.

Double: A thread in which lead is equal to twice the pitch.

Triple: A thread in which lead is equal to triple the pitch.

General hints on tapping

The success of any tapping operation depends on a number of factors, all of which affect the quality of the finished product.

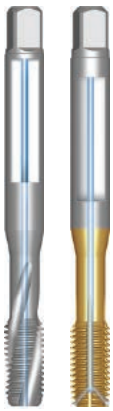
1. Select the correct design of tap for the component material and type of hole, i.e. through or blind, from the Materials Classification chart.
2. Ensure the component is securely clamped – lateral movement may cause tap breakage or poor quality threads.
3. Select the correct size of drill from the relevant catalogue page. Always ensure that work hardening of the component material is kept to a minimum.
4. Select the correct cutting speed as shown on the catalogue product page.
5. Use appropriate cutting fluid for correct application.
6. In NC applications ensure that the feed value chosen for the program is correct. When using a tapping attachment, 95% to 97% of the pitch is recommended to allow the tap to generate its own pitch.
7. Where possible, hold the tap in a good quality torque limiting tapping attachment, which ensures free axial movement of the tap and presents it squarely to the hole. It also protects the tap from breakage if accidentally 'bottomed' in a blind hole.
8. Ensure smooth entry of the tap into the hole, as an uneven feed may cause 'bell mouthing'.

Tap tolerance vs tolerance on internal thread (nut)

Tolerance class, Tap			Tolerance, Internal thread (Nut)					Application
ISO	DIN	ANSI BS						
ISO 1	4 H	3 B	4 H	5 H	–	–	–	Fit without allowance
ISO 2	6 H	2 B	4 G	5 G	6 H	–	–	Normal fit
ISO 3	6 G	1 B	–	–	6 G	7 H	8 H	Fit with large allowance
–	7 G	–	–	–	–	7 G	8 G	Loose fit for following treatment or coating

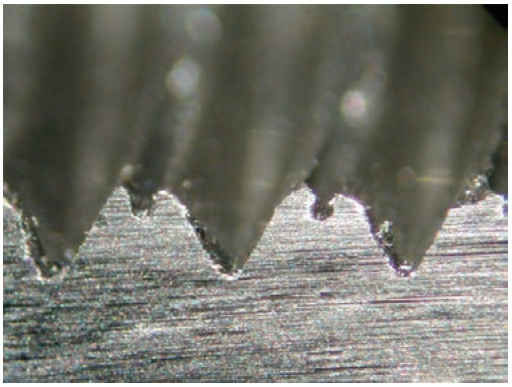
Tap Geometries & Applications

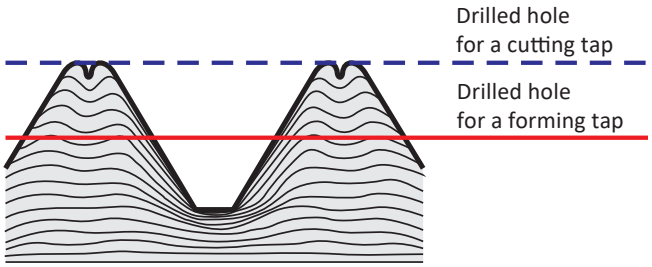
Description	Chips
Taps with straight flutes Straight flutes are the most commonly used type of tap. Suitable for use on most materials, mainly short chipping steel and cast iron, they form the basis of the program.	
Taps with interrupted thread The interrupted thread ensures less friction and therefore less resistance, which is particularly important when threading material which is resilient and difficult to machine (e.g. aluminium, bronze). It is also easier for lubricant to penetrate to the cutting edges, thus helping to minimize the torque generated.	
Spiral point taps The tap has a straight fairly shallow flute and is often referred to as a gun nose or spiral point tap. The gun nose or spiral point is designed to drive the chips forward. The relatively shallow flutes ensure that the sectional strength is maximised. They also act to allow lubricant to reach the cutting edges. This type of tap is recommended for threading through holes.	
Nut taps These taps are generally used to thread nuts but can be used also on deep through holes. They have a shank diameter smaller than the nominal and a longer overall length, because their function is to accumulate nuts. They are used on special machines designed to thread huge amounts of nuts. They can work in steel and stainless steel. The first serial tap has a very long chamfer, in order to spread the cutting load on almost two thirds of the thread length.	

Description	Chips
Taps with flutes only on the chamfer lead The cutting part of the tap is formed by gun nosing in the same manner as for a spiral point tap, the function being to drive the chips forward ahead of the cutting edges. This design is extremely rigid which facilitates good machining results. However, the short length of the gun nosing limits its application to a depth of hole less than about $1.5 \times TDZ$.	
Taps with spiral flutes Taps with spiral flutes are intended primarily for threading in blind holes. The helical flute transports the chips back away from the cutting edges and out of the hole, thus avoiding packing of chips in the flutes or at the bottom of the hole. In this way, danger of breaking the tap or damaging the thread is minimised.	
Cold forming taps Cold forming taps differ from cutting taps in that the thread is produced by plastic deformation of the component material rather than by the traditional cutting action. This means that no chips are produced by their action. The application range is materials with good formability. Tensile strength (*Rm*) should not exceed 1200 N/mm^2 and the elongation factor (A_5) should not be less than 10 %. Cold forming taps without flutes are suitable for normal machining and are especially suitable when vertically tapping blind holes. They are also available with through coolant.	
Through coolant taps The performance of taps with through coolant holes is higher than the same taps used with external lubrication. These kinds of taps allow better evacuation of the chip, which is transported away from the cutting area itself. Wear on the cutting edge is reduced, since the cooling effect on the cutting zone is higher than the heat generation. Lubrication can be oil, emulsion or air pressurised with oil mist. Working pressure not less then 15 bar is required, but good results can be obtained with minimal lubrication.	

Flow Of Material When Forming A Thread

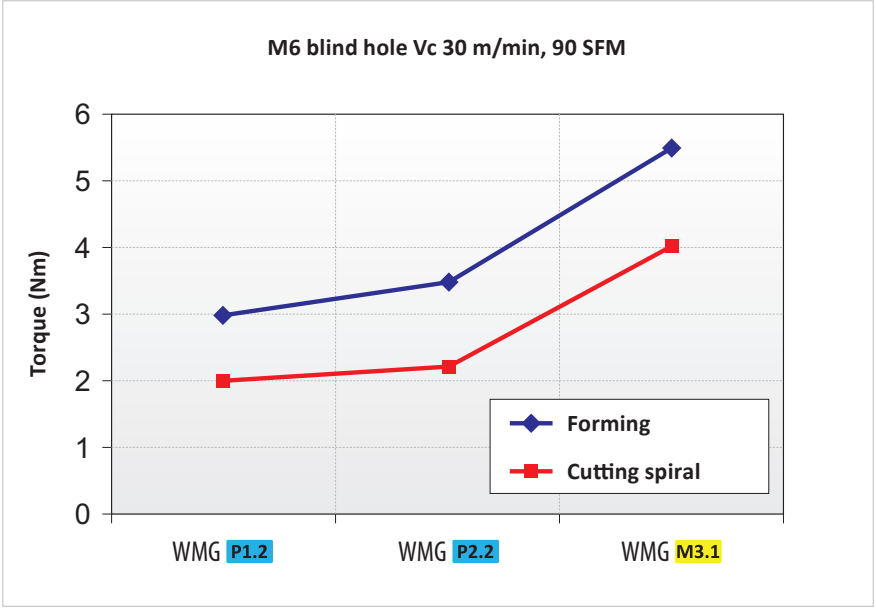
The tapping hole size depends upon the material being drilled, the cutting conditions selected and the condition of the equipment being used. If material is pushed up at the thread entry by the tap and/or the life of the tap is too short, select a slightly larger drill diameter. If on the other hand the profile of the thread formed is insufficient, then select a slightly smaller drill diameter.





Section of thread obtained by forming tap on steel C45″.

Cold forming taps require more power on the spindle, compared to a cutting tap of the same size, since it generates higher torque.



Torque comparison between forming and cutting taps in different material groups.

Trouble Shooting When Tapping

Problem	Cause	Remedy
Oversize	Incorrect tolerance.	Choose a tap with lower thread tolerance.
	Incorrect axial feed rate.	Reduce feed rate by 5 – 10 % or increase compression of tap holder.
	Wrong type of tap for application.	Use spiral point for through hole or spiral flute for blind hole. Use coated tool to prevent built up edge. Check Catalogue or Product Selector for correct tool alternative.
	Tap not centered on the hole.	Check tap holder and position tap centre on the hole.
	Lack of lubrication.	Use good lubrication in order to prevent built up edge. See lubricant section in technical handbook.
	Tap speed too slow .	Follow recommendation in Catalogue/Product Selector.
Undersize	Wrong type of tap for application.	Use spiral point for through hole or spiral flute for blind hole. Use coated tool to prevent built up edge. Use tap with higher rake angle. Check Catalogue or Product Selector for correct tool alternative.
	Incorrect tolerance.	Choose a tap with higher tolerance, especially on material with low oversize tendency, such as cast iron, stainless steel.
	Incorrect or lack of lubricant.	Use good lubrication in order to prevent chip blockage inside the hole. See lubricant section in technical handbook.
	Tap drill hole too small.	Increase drill diameter to the maximum value. Check tapping size drill.
	Material closing in after tapping.	See recommendation in Catalogue/Product Selector for correct tool alternative.
Chipping	Wrong type of tap for application.	Choose a tap with lower rake angle. Choose a tap with longer chamfer. Use spiral point taps for through hole and spiral flute for blind holes, in order to avoid chip blockage. Check Catalogue or Product Selector for correct tool alternative.
	Incorrect or lack of lubricant.	Use good lubrication in order to prevent built up edge. See lubricant section in technical handbook.
	Taps hit bottom of hole.	Increase depth of drilling or decrease depth of tapping.
	Work hardening surface.	Reduce speed, use coated tool, use good lubrication. See section for machining of stainless steel in technical handbook.
	Swarf trapping on reversal.	Avoid sudden return of tap on reversal motion.
	Chamfer hits hole entrance.	Check axial position and reduce axial error of tap point on hole centre
	Tap drill hole too small.	Increase drill diameter to maximum value. Check tapping size drill.

Trouble Shooting When Tapping

Problem	Cause	Remedy
Breakage	Tap worn out.	Use a new tap or regrind the old one.
	Lack of lubricant.	Use good lubrication in order to prevent built up edge and chip blockage. See lubricant section in technical handbook.
	Taps hit bottom of hole.	Increase depth of drilling or decrease depth of tapping.
	Tap speed too high.	Reduce cutting speed. Follow recommendation in Catalogue / Product Selector
	Work hardening surface.	Reduce speed. Use coated tool Use good lubrication. See section for machining of stainless steel in technical handbook.
	Tap drill hole too small.	Increase drill diameter up to maximum value. See tap drill tables.
	Too high torque.	Use tapping attachment with torque adjustment clutch.
	Material closing in after tapping.	See recommendation in Catalogue/Product Selector for correct tool alternative.
Rapid wear	Wrong type of tap for application.	Use tap with lower rake angle and/or higher relief and/or longer chamfer. Use coated tool. Check Catalogue or Product Selector for correct tool alternative.
	Lack of lubricant.	Use good lubrication in order to prevent built up edge and thermal stress on cutting edge. See lubricant section in technical handbook.
	Tap speed too high.	Reduce cutting speed. Follow recommendation in Catalogue/Product Selector.
Built up edge	Wrong type of tap for application.	Use tap with lower rake angle and/or higher relief. Check Catalogue or Product Selector for correct tool alternative.
	Lack of lubricant.	Use good lubrication in order to prevent built up edge. See lubricant section in technical handbook.
	Surface treatment not suitable.	Choose a tap with the recommended surface treatment.
	Tap speed too low.	Follow recommendation in Catalogue/Product Selector.

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SIMPLY RELIABLE

As a professional you can judge the quality of work by just looking at the chip. Our chip is a clean and uncomplicated shape that in itself tells a story. It is a clear and consistent signal and that's why we use it as a symbol for being **Simply Reliable**.

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