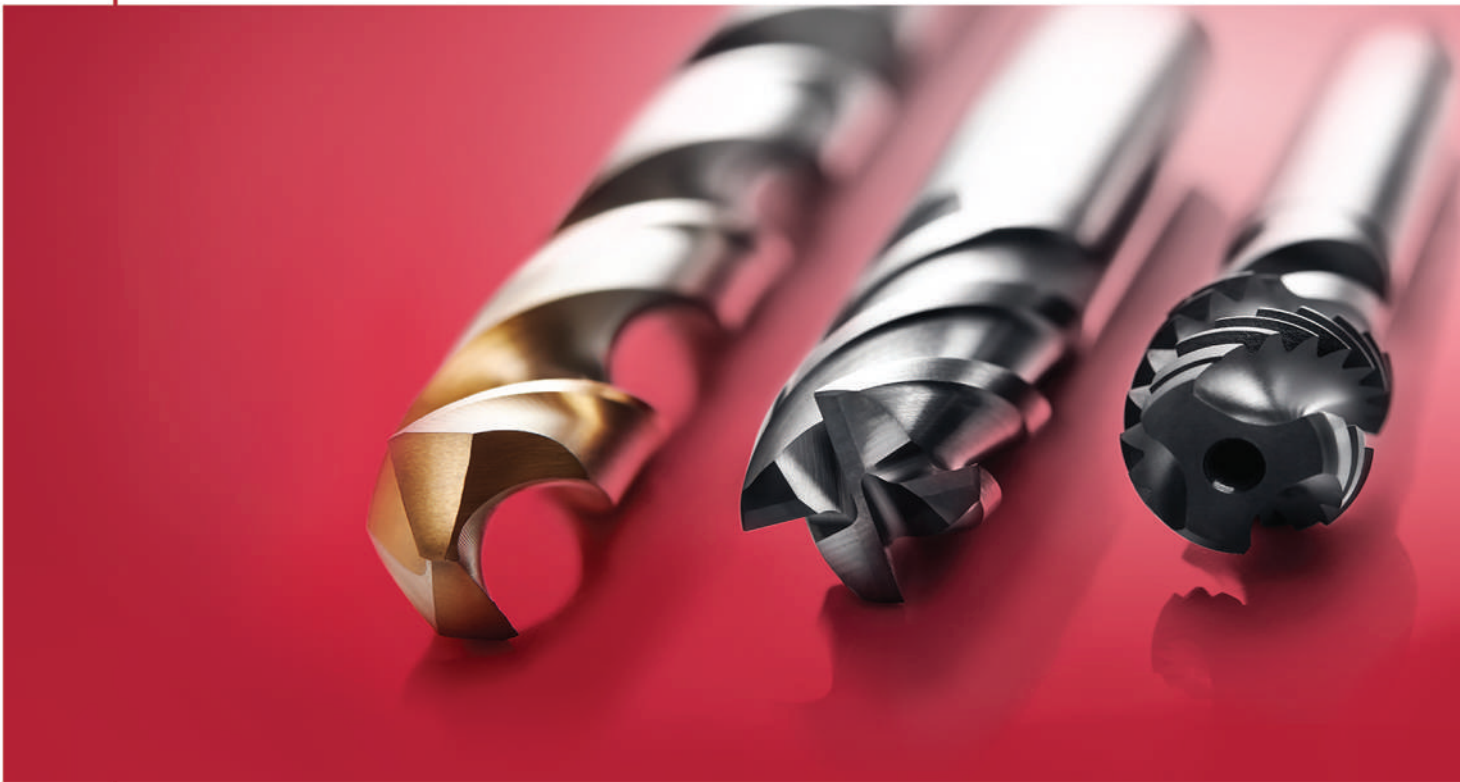




**SIMPLY RELIABLE**

**INFORMASI MATA BOR DAN CUTTING TOOLS**



Mata bor • End Mill • Taper • Center Drill  
Reamer • Hand Tap & Machine Tap

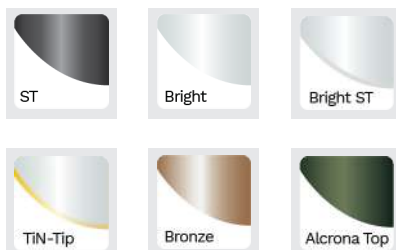


ISO Group	WMG (Work Material Group)		Hardness (HB or HRC)	Ultimate Tensile Strength (MPa)		
<b>P</b>	<b>P1</b>	P1.1	Sulfurized	< 240HB	≤ 830	
		P1.2	Free machining steel (carbon steels with increased machinability)	Sulfurized and phosphorized	< 180 HB	≤ 620
		P1.3		sulfurized/phosphorized and leaded	< 180 HB	≤ 620
	<b>P2</b>	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	< 300HB	≤ 1030
	<b>P3</b>	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
	<b>P4</b>	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			3 - 45 HRC	> 1240 ≤ 1450
<b>M</b>	<b>M1</b>	M1.1	Ferritic stainless steel (straight chromium non-hardenable alloys.)	< 160 HB	≤ 520	
		M1.2		160 - 220 HB	> 520 ≤ 700	
	<b>M2</b>	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
	<b>M3</b>	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	
	<b>M4</b>	M4.1	Austenitic-ferritic (DUPLEX) or super-austenitic stainless steel	< 300 HB	≤ 990	
		M4.2	Precipitation hardening austenitic stainless steel	300 - 380 HB	≤ 1320	
<b>K</b>	<b>K1</b>	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-pearlitic or peralitic	180 - 240 HB	> 190 ≤ 310
		K1.3		Peralitic	240 - 280 HB	> 310 ≤ 390
	<b>K2</b>	K2.1	Malleable-iron (GTS/GTW) (iron-carbon castings with a lamellar graphite microstructure)	Ferritic	< 160 HB	≤ 400
		K2.2		Ferritic or pearlitic	160 - 200 HB	> 400 ≤ 550
		K2.3		Pearlitic	200 - 240 HB	> 550 ≤ 660
	<b>K3</b>	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
	<b>K4</b>	K4.1	Austenitic gray iron (ASTM A436) (iron-carbon castings with a nodular graphite microstructure)	< 180 HB	≤ 190 HB	
		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	
	<b>K5</b>	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	

**GENERAL ICONS**

Kegunaan Utama

Dapat Digunakan

**COATING / FINISHING**

**MATERIAL**
**HSS** High Speed Steel Tool Material

 **HSS-E** High Speed Cobalt Steel Tool Material

 **HSS HM** High Speed Steel (tool body) with Solid Carbide (cutting tool material)

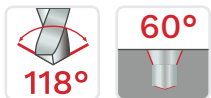
ISO Group	WMG (Work Material Group)		Hardness (HB or HRC)	Ultimate Tensile Strength (MPa)		
<b>N</b>	<b>N1</b>	N1.1	Commercially pure wrought aluminium	< 60 HB	≤ 240	
		N1.2	Wrought aluminium alloys	Half hard tempered	> 240 ≤ 400	
		N1.3		Full hard tempered	> 400 ≤ 590	
	<b>N2</b>	N2.1	Cast aluminium alloys		< 75 HB	≤ 240
		N2.2		75 - 90 HB	> 240 ≤ 270	
		N2.3		90 - 140 HB	> 270 ≤ 440	
	<b>N3</b>	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	-	-	
	<b>N4</b>	N4.1	Thermoplastic polymers	-	-	
		N4.2	Thermosetting polymers	-	-	
		N4.3	Reinforced polymers or composites	-	-	
	<b>N5</b>	N5.1	Graphite	-	-	
	<b>S</b>	<b>S1</b>	S1.1	Titanium or titanium alloys	< 200 HB	≤ 660
			S1.2		200 - 180 HB	> 660 ≤ 950
S1.3			280 - 360 HB		> 950 ≤ 1200	
<b>S2</b>		S2.1	Fe-based high-temperature alloys	< 200 HB	≤ 690	
		S2.2		200 - 280 HB	> 690 ≤ 970	
<b>S3</b>		S3.1	Ni-based high-temperature alloys	< 280 HB	≤ 940	
		S3.2		280 - 360 HB	> 940 ≤ 1200	
<b>S4</b>		S4.1	Co-based high-temperature alloys	< 240 HB	≤ 800	
		S4.2		240 - 320 HB	> 800 ≤ 1070	
<b>H</b>	<b>H1</b>	H1.1	Chilled cast iron	< 440 HB	-	
	<b>H2</b>	H2.1	Hardened cast iron	< 55 HRC	-	
		H2.2		> 55 HRC	-	
	<b>H3</b>	H3.1	Hardened steel <55 HRC	< 51 HRC	-	
		H3.2		51 - 55 HRC	-	
	<b>H4</b>	H4.1	Hardened steel > 55 HRC	55 - 59 HRC	-	
		H4.2		> 59 HRC	--	

**STANDARD**

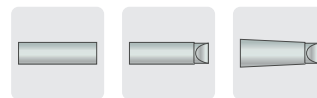

NAS: National Aerospace Standards  
 DIN: German Institute for Standardization  
 ISO: The International Organization for Standardization  
 BS : British Standards

**ARAH PEMOTONGAN**


L : Arah melawan jarum jam.  
 R : Arah searah jarum jam.

**SUDUT PENGGUNAAN**


Sudut pada ujung matabor ditentukan jenis material yang akan dibor.

**BENTUK SHANK**


Bentuk Shank mata bor (bagian yang dipasang pada bagian chuck mesin bor)

**KEDALAMAN**


Kedalaman mata bor dapat diukur berdasarkan diameter dari mata bor tersebut dikalikan **angka merah** yang ada di sebelah kiri.

**LAINNYA**


Tipe Lubang Through/Blind



DIN Thread Pitch



Taper Gradient (1mm per 50 mm taper)



Thread Form Metric Coarse



DIN FORM A: Straight Flute ≤ Φ3.5 mm  
 DIN FORM B: Spiral Flute ≤ Φ3.5 mm  
 DIN FORM E: Straight Flute ≥ Φ3.5 mm



# A100

## HSS JOBBER DRILL STRAIGHT

Ideal digunakan untuk aplikasi permesinan pada semua jenis bahan material.

Blue finish bright untuk ukuran dibawah 1mm (3/64")

ST HSS DIN 338 4xD 118° R

■	P1.1	P1.2	P1.3	P2.1	P2.2	P3.1	P3.2	P4.1	K1.1	K1.2	K1.3															
▣	P2.3	P3.3	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4				
▣	K4.5	K5.1	K5.2	K5.3	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.1	N4.2	N4.3	S1.1	S1.2	S1.3	S2.1	S2.2	S3.1				
	S3.2	S4.1	S4.2																							



# A002

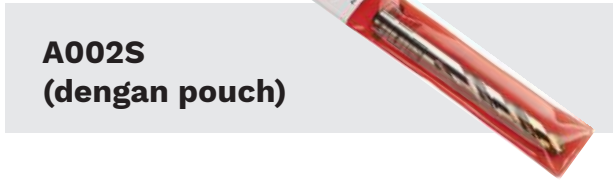
## HSS TiN TIP JOBBER DRILL SPLIT POINT

Self-centering split point untuk akurasi dan kualitas lubang yang sangat baik.

Lapisan TiN pada ujung mata bor meningkatkan performa (uk. 2 mm keatas) dan membuat mata bor semakin awet.

TiN-Tip HSS DIN 338 4xD 118° R

■	P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	K1.1	K1.2	K1.3	N1.1	N1.2	N1.3	N4.1	N4.2				
▣	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5	K5.1	K5.2	K5.3	N2.1	N2.2
▣	N2.3	N3.1	N3.2	N3.3	N4.3	S1.1	S1.2	S1.3	S2.1	S2.2	S3.1	S3.2	S4.1	S4.2										



**A002S**  
(dengan pouch)



# A777

## HSS-E (8% COBALT) JOBBER DRILL BRONZE

135° split point mengurangi gaya axial sehingga memastikan mata bor langsung memotong secara instan.

Konstruksi ulir heavy duty pada mata bor memberikan tenaga yang memadai untuk mengebor material yang alot dan keras (>49 HRC)

Dibuat dengan material premium HSS-E (High Speed Cobalt) dengan kadar cobalt 8%.

Bronze HSS-E DIN 338 4xD 135° R

■	P2.3	P3.3	P4.2	P4.3	K2.3	K3.3	K4.3	K4.4	K4.5	K5.3	S1.1	S1.2	S1.3	S2.1	S3.1	S4.1								
▣	P1.1	P1.2	P1.3	P2.1	P2.2	P3.1	P3.2	P4.1	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1	K1.1	K1.2	K1.3	K2.1	K2.2	K3.1		
▣	K3.2	K4.1	K4.2	K5.1	K5.2	N1.1	N1.2	N1.3	N4.1	N4.2	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.3	S2.2	S3.2	S4.2				



# A147

**HSS-E (5% COBALT) JOBBER DRILL**

Didesain untuk material stainless steel.

Self-centering split point (130°) untuk akurasi dan kualitas lubang yang sangat baik.

■	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1	S1.1	S1.2																																								
☐	P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	M2.3	M4.2	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	K5.1	K5.2	K5.3	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.1	N4.2	N4.3	S1.3	S2.1	S2.2	S3.1	S3.2	S4.1	S4.2



# A901

**PFX HSS-E (5% COBALT) JOBBER DRILL**

Mata bor high-performance, menghasilkan lubang berkualitas tinggi dan akurat pada kecepatan yang tinggi (toleransi lubang H10).

Sudut 130° dan desain seruling parabola khusus.

Cocok untuk berbagai material. Lapisan Alcrona-TOP meningkatkan kinerja dan memperpanjang usia pakai.

■	P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1	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	K5.1	K5.2	K5.3
☐	S1.1	S1.2	S1.3	S2.1	S2.2	S3.1	S3.2	S4.1	S4.2																												

## DRILL SET



### A100 HSS JOBBER DRILL SET

PRODUK	UKURAN	ISI/ SET
A190201	1.0 - 10.5 x 0.5 + 3.3, 4.2, 6.8, 10.2	24 PCS SET
A190202	1.0 - 10.0 x 0.5	19 PCS SET
A190203	1.0 - 6.0 x 0.1	51 PCS SET
A190204	6.0 - 10.0 x 0.1	41 PCS SET
A190206	1.0 - 13.0 x 0.5	25 PCS SET
A190209	1.0 - 13.0 x 0.5 + 3.3, 4.2, 6.8, 10.3	29 PCS SET

### A002 HSS JOBBER DRILL SET

PRODUK	UKURAN	ISI/ SET
A095200	1.0 - 10.5 x 0.5 + 3.3, 4.2, 6.8, 10.2	24 PCS SET
A095201	1.0 - 10.0 x 0.5	19 PCS SET
A095202	1.0 - 6.0 x 0.1	51 PCS SET
A095203	6.0 - 10.0 x 0.1	41 PCS SET
A095204	1.0 - 13.0 x 0.5	25 PCS SET
A095206	1.0 - 13.0 x 0.5 + 3.3, 4.2, 6.8, 10.3	29 PCS SET
A095209	1.0 - 10.0 x 0.1	91 PCS SET

### A777 HSS-E JOBBER DRILL SET

PRODUK	UKURAN	ISI/ SET
A295219	1.0 - 10.0 x 0.5	19 PCS SET
A295225	1.0 - 13.0 x 0.5	25 PCS SET

# A125

## HSS EXTRA LENGTH DRILL

Mata bor HSS Straight Shank dengan ukuran extra panjang.

Dengan ujung 118°, memudahkan penetrasi kedalam permukaan bidang kerja.

Terbuat dari material HSS Steam Tempered.



	<b>HSS</b>	<b>BS 328</b>	<b>10xD</b>			
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■	P1.1	P1.2	P1.3	P2.1																		
▣	P2.3	P3.3	P4.2	P4.3	P2.2	P3.1	P3.2	P4.1	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1	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	K5.1	K5.2	K5.3	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.1	N4.2
	N4.3	S1.1	S1.2	S1.3	S2.1	S2.2	S3.1	S3.2	S4.1	S4.2												

# A130

## HSS TAPER SHANK DRILL

Dengan ujung bersudut 118°, menipis di atas diameter 14 mm sehingga memudahkan menembus material kerja.

Konstruksi ulir yang kuat memberikan tenaga cross sectional saat mengebor pada kondisi yang tidak selalu ideal.

Morse taper shank memungkinkan mata bor dipasang langsung ke mesin.



	<b>HSS</b>	<b>DIN 345</b>	<b>4xD</b>			
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■	P1.1	P1.2	P1.3	P2.1	P2.2	P3.1	P3.2	P4.1	K1.1	K1.2	K1.3											
▣	P2.3	P3.3	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4
▣	K4.5	K5.1	K5.2	K5.3	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.1	N4.2	N4.3	S1.1	S1.2	S1.3	S2.1	S2.2	S3.1
	S3.2	S4.1	S4.2																			

# A730

## HSS-E (8% COBALT) TAPER SHANK DRILL

Direkomendasikan untuk material dan aplikasi yang sulit. Sudut 118° memberikan titik kuat yang mudah untuk disesali.

Cocok untuk mengebor banyak material. Lapisan pelindung adalah lapisan oksida tipis dan merupakan indikasi untuk Cobalt.



	<b>HSS-E</b>	<b>DIN 345</b>	<b>4xD</b>			
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■	P2.3	P3.3	P4.2	P4.3	M3.1	M3.2	M3.3	M4.1	K2.3	K3.3	K4.3	K4.4	K4.5	K5.3											
▣	P1.1	P1.2	P1.3	P2.1	P2.2	P3.1	P3.2	P4.1	M1.1	M1.2	M2.1	M2.2	K1.1	K1.2	K1.3	K2.1	K2.2	K3.1	K3.2	K4.1	K4.2	K5.1	K5.2		
	N1.1	N1.2	N1.3	N4.1	N4.2	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.3	S2.2	S3.2	S4.2	S1.1	S1.2	S1.3	S2.1	S3.1	S4.1				



# A200

## HSS CENTER DRILL

Untuk mengebor komponen yang memerlukan pengerjaan pada titik pusat.

60° sudut countersink, 118° sudut ujung dan bright finish.

Bright ST
HSS
DIN 333A
1xD
60°

R

■	P1.1	P1.2	P1.3	P2.1	P2.2	P3.1	P3.2	P4.1	K1.1	K1.2	K1.3											
☐	P2.3	P3.3	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M3.1	M3.2	M3.3	M4.1	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4
	K4.5	K5.1	K5.2	K5.3	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.1	N4.2	N4.3	S1.1	S1.2	S1.3	S2.1	S2.2	S3.1
	S3.2	S4.1	S4.2																			



# C247

## END MILL 4 FLUTES

Dibuat dengan teknologi powdered steel cobalt material.

Mengurangi kemungkinan chipping (sisa hasil bor tersendat)

Kemampuan pemotongan pusat, mampu membentuk, menekan dan mengikis ke dalam.

Performa yang baik dan awet dibandingkan end-mill biasa.

Bright ST
HSS
DIN 333A
1xD
118°

R

■	P1.1	P1.2	P1.3	P2.1	P2.2	N3.1	N3.2	N3.3	S1.1														
☐	P3.1	P3.2	P4.1	M1.1	M1.2	M2.1	M2.2	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	K5.1	
	K5.2	K5.3	N1.1	N1.2	N1.3	N2.1	N2.2	N2.3	N4.1	S1.2	S2.1	S3.1	S4.1										



# E500

## STRAIGHT FLUTE HAND TAP

Membuat ulir pada lubang (blind & through)

Cocok untuk berbagai material (besi<1200N/mm, besi cor, tembaga, kuningan, aluminium, plastik dan fiber plastik, thermosetting plastik)

Bright
HSS
ISO 529
M
1.5xD

6H

■	P1.1	P1.2	P1.3	P2.1	P2.2	P3.1																		
☐	P2.3	P3.2	P4.1	P4.2	K1.1	K1.2	K1.3	K2.1	K2.2	K3.1	K3.2	K4.1	K4.2	K5.1	K5.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	N4.2	N4.3

TERSEDIA DALAM SET OF 3





## EX006H

M MACHINE TAP SPIRAL FLUTE 45°

Membuat ulir pada lubang, cocok untuk berbagai jenis material.

Thread yang pendek memungkinkan torsi rendah dan chip lebih mudah keluar.

Material High Speed Cobalt Steel (HSS-E) substrate menambah kekuatan pada ujungnya sehingga tidak mudah aus.

**HSS-E** **DIN 376** **M** **2.5xD** **6H**

- P1.1 P1.2 P1.3 P2.1 P2.2 P3.1 N2.1 N2.2 N2.3**
- P2.3 P3.2 P4.1**



## EP006H

M MACHINE TAP SPIRAL POINT

Membuat ulir pada lubang, cocok untuk berbagai jenis material.

Thread yang pendek memungkinkan torsi rendah dan chip lebih mudah keluar.

Material High Speed Cobalt Powder Metal (HSS-E PM) menambah kekuatan pada ujungnya sehingga tidak mudah aus.

**HSS-E PM** **DIN 376** **M** **2.5xD** **6H**

- P1.1 P1.2 P1.3 P2.1 P2.2 P3.1 N1.1 N1.2 N1.3 N2.1 N2.2 N2.3 N3.1**
- P2.3 P3.2 P4.1 N3.2 N3.3 N4.1**



## B100

HSS STRAIGHT SHANK HAND REAMER

Cocok untuk material ferrous dan non-ferrous.

Untuk memperbesar dan menghaluskan sisi-sisi lubang yang sudah terbentuk.

Menghasilkan ukuran lubang yang akurat dan permukaan finishing yang baik.

**HSS** **DIN 206** **H7**

- P1.1 P1.2 P1.3 P2.1 P2.2 P3.1 K1.1 K1.2 K2.1 K2.2 K3.1 N1.2 N1.3 N2.1 N2.2 N3.1 N3.2**
- P2.3 P3.2 P3.3 P4.1 P4.2 P4.3 M1.1 M1.2 M2.1 K2.3 K3.2 N1.1 N2.3 N4.1 N4.1**



## B101

HSS-E TAPER SHANK MACHINE REAMER

Machine reamer yang sangat presisi.

Cocok untuk berbagai jenis material.

Menghasilkan ukuran lubang yang akurat dan permukaan finishing yang baik.

**HSS-E** **BS 328** **H7**



- P1.1 P1.2 P1.3 P2.1 P2.2 P3.1 K1.1 K1.2 K2.1 K2.2 K3.1 N1.2 N1.3 N2.1 N2.2 N3.1 N3.2**
- P2.3 P3.2 P3.3 P4.1 P4.2 P4.3 M1.1 M1.2 M2.1 K2.3 K3.2 N1.1 N2.3 N4.1 N4.1**

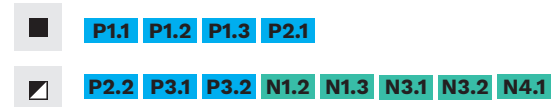




## E650

### M COMBI TAPS SPIRAL FLUTE 30°

Kombinasi drill-tap dengan 30° spiral flute.

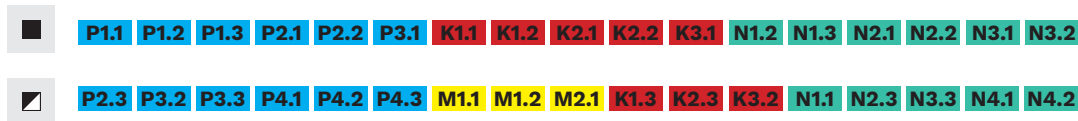
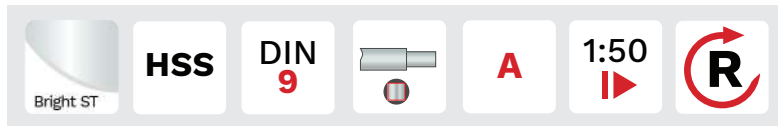


## B903

### HSS SHANK TAPER PIN HAND REAMER

Cocok untuk proses reaming pada berbagai bahan material.

Ujung diameter yang mengecil mempermudah memasukkan dan memusatkan alat reamer pada lubang.



## Tabel ukuran metric Hand Tap

M			
Ø	P mm	Ø mm	Ø mm
1.00	0.25	0.75	0.90
1.60	0.35	1.25	1.40
1.80	0.35	1.45	1.65
2.00	0.40	1.60	1.80
2.20	0.45	1.75	2.00
2.50	0.45	2.05	2.30
3.00	0.50	2.50	2.80
3.50	0.60	2.90	3.20
4.00	0.70	3.30	3.70
4.50	0.75	3.80	4.15
5.00	0.80	4.20	4.60
6.01	1.00	5.00	5.50

M			
Ø	P mm	Ø mm	Ø mm
7.0	1.00	6.00	6.50
8.0	1.25	6.80	7.40
9.0	1.25	7.80	8.40
10.0	1.50	8.50	9.30
11.0	1.50	9.50	10.30
12.0	1.75	10.30	11.20
14.0	2.00	12.00	13.00
16.0	2.00	14.00	15.00
18.0	2.50	15.50	16.80
20.0	2.50	17.50	18.90
22.0	2.50	19.50	20.80
24.0	3.00	21.00	22.70

M			
Ø	P mm	Ø mm	Ø mm
27.0	3.00	24.00	
30.0	3.50	26.50	
33.0	3.50	29.50	
36.0	4.00	32.00	
39.0	4.00	35.00	
42.0	4.50	37.50	
45.0	4.50	40.50	
48.0	5.00	43.00	
52.0	5.00	47.00	
56.0	5.50	50.50	
64.0	6.00	58.00	

# **DORMER**

**SIMPLY RELIABLE**



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