



# B

B - DRILLING

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# DRILLING



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B - 256 | Jet Drills

B - 260 | Vortex Drill

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# DRILLS CODE KEY || Sistema de codificação para brocas | Sistema de codificación para brocas

DRILLING

**S C I**

Drill group

**0 7 5 0**

Shank diameter:  $\varnothing$ 0.750 in

**0 5 3 1**

Drilling diameter:  $\varnothing$ 0.531 in

**3 D**

Drilling depth: Dia x 3

Inserts

**M D O**

Drill group

**0 8 5 0 9 0**

Drilling diameter:  $\varnothing$ 85 'till  $\varnothing$ 90 mm

**2 7**

Shank diameter:  $\varnothing$ 27 mm

Jet Drill

**M D S**

Drill group adapter

**3 2**

Shank diameter:  $\varnothing$ 32 mm

**1 1 5**

Flute length: 115 mm

**1 3 0**

Shank diameter for MDO:  $\varnothing$ 13 mm

Vortex Drill

**M D E**

Drill group adapter

**1 3**

Shank diameter:  $\varnothing$ 13 mm

**1 1 5**

Flute length: 115 mm

**2 8 0**

Shank diameter for MDO:  $\varnothing$ 28 mm

Solid Carbide Drills

**H BD P U E 2 03D i 0860 - 089 047**

Drill group

Drill Series

Main workpiece material:  
P: Steel

Cooling:  
U: No coolant channel  
C: w/ coolant channel

Coupling:  
E: cylindrical  
W: Weldon

Number of  
flutes

Drill depth

Imperial Line  
(suppressed when  
metric)

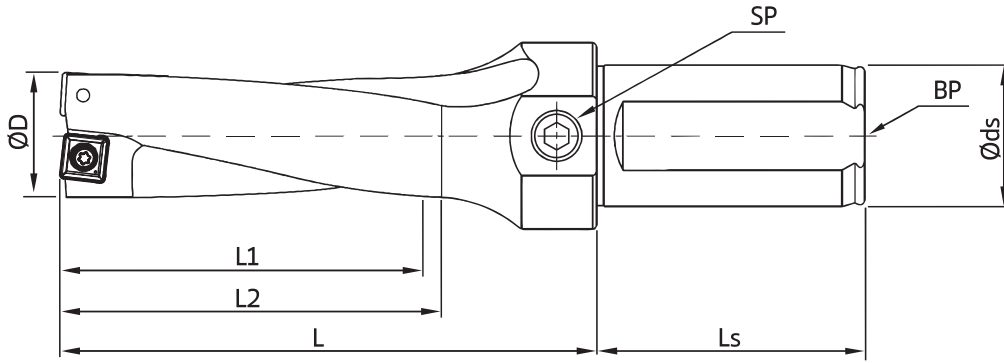
Drill diameter:  
 $\varnothing$ 8,6mm

Total length:  
89mm

Flute length:  
47mm

Spare Parts

Technical Data



- $\varnothing D$  - Drill diameter      L - Length      L1 - Cut length      SP - Side plug
- $\varnothing ds$  - Shank diameter      Ls - Shank Length      L2 - Safety cut length      BP - Back plug

## COOLANT SUPPLY | Furos de refrigeração | Agujeros de refrigeración

New version / Standard version \*

Type	BP	SP
SCI	✓ / ✓	✗ / ✓
MDO	✓ / ✓	✓ / ✓

- BP - Back Plug
- SP - Side Plug
- ✓ - Available
- ✗ - Not Available

\* The new Drill version will replace the standard version when this type will be sold out.

New version / Standard version \*

Type	BP	SP
TDS	✓ / ✓	✗ / ✓
TDC	✓ / ✓	✓ / ✓
SCS	✓ / ✓	✗ / ✓
SCC	✓ / ✓	✓ / ✓
DHS	✓ / ✓	✗ / ✓
DHC	✓ / ✓	✗ / ✓
TFD	✓ / ✓	✓ / ✓
MDO	✓ / ✓	✓ / ✓
PND	✓ / ✓	✓ / ✓

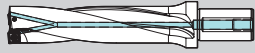
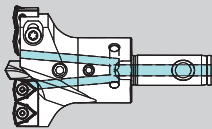


- BP - Back Plug
- SP - Side Plug
- ✓ - Available
- ✗ - Not Available

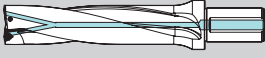
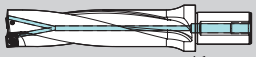
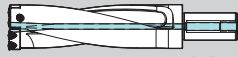
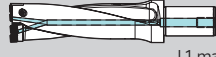


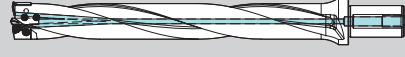
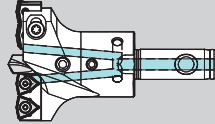
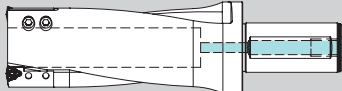


METRIC LINE available at [www.palbitusa.com](http://www.palbitusa.com)



# OVERVIEW | Vista genérica | Información general

- DRILLING
- Inserts
- Jet Drill
- Vortex Drill
- Solid Carbide Drills
- Spare Parts
- Technical Data

	Diameter (in)									
	0.118	0.472	0.787	1.260	1.969	2.362	2.756	3.150	4.331	... 7.087
Jet Drills			SCI Drill (3D-4D)  Page B - 256      L1 max = 7.752 in							
Vortex Drills						Vortex Drill  Page B - 260      L1 max = 900 mm				
Solid Carbide Drills		HBDP ... SC Drill (3D-5D)  Page B - 264      L1 max = 3.976 in								
		HBDP ... SC Drill (3D)  Page B - 264      L1 max = 6.378 in								

	Diameter (mm)									
	03	12	20	32	50	60	70	80	110	... 180
Jet Drills			TDS 3D Drill  L1 max = 174mm							
			SCS Drill (3D-4D)  L1 max = 200mm				TDC 3D Drill  L1 max = 240mm			
							SCC Drill (3D-4D)  L1 max = 320mm			
Integrex Drills			DHS Drill (6D-8D)  L1 max = 300mm							
			TFD Drill (6D-8D)  L1 max = 240mm				DHC Drill (5D-8D)  L1 max = 640mm			
Vortex Drills							Vortex Drill  L1 max = 900mm			
Trepanning Drills							PND Drill  L1 max = 250mm			
Solid Carbide Drills	HBDP ... SC Drill (3D-5D)  L1 max = 101mm									
	HBDP ... SC Drill (8D)  L1 max = 162mm									

METRIC LINE available at [www.palbitusa.com](http://www.palbitusa.com)

# ISO DRILLING INSERTS CODE KEY

DRILLING

Inserts

Jet Drill

Vortex Drill

Solid Carbide Drills

Spare Parts

Technical Data

H		M	
O		V	
P		W	
S		L	
T		A	
C		B	
D		K	
E		R	
F		X	Special

1- Insert shape symbol

Symbol	m (mm)	d (mm)	s (mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05~±0.13	±0.025
K*	±0.013	±0.05~±0.13	±0.025
L*	±0.025	±0.05~±0.13	±0.025
M*	±0.08~±0.20	±0.05~±0.13	±0.13
N*	±0.08~±0.20	±0.05~±0.13	±0.025
U*	±0.13~±0.38	±0.08~±0.25	±0.13

\*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size, for the accuracy of class M, refer to the table on the right.

Triangular inserts with a facet (secondary cutting edge)

Detailed dimension of M class insert Insert height Tolerances (mm)					
Inscribed circle	T	S	C	D	V
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.11	±0.10	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed circle Tolerances (mm)					
Inscribed circle	T	S	C	D	V
6.35	±0.05	-	-	-	-
9.525	±0.05	±0.05	±0.05	±0.05	±0.05
12.70	±0.08	±0.08	±0.08	±0.08	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	±0.10
19.05	-	-	-	-	±0.10
25.40	-	±0.13	-	-	±0.10
31.75	-	±0.20	-	-	±0.12

3 - Tolerances symbol

A	B	C	D	E
F	G	N	P	O
				Other clearance angle

2 - Normal clearance symbol

ISO **W C K X**

4 - Insert symbol															
symbol	Type	Hole type	Chipbreaker	Shape	symbol	Type	Hole type	Chipbreaker	Shape	symbol	Type	Hole type	Chipbreaker	Shape	
W	with hole	Round hole / one countersink (40°-60°)	Without chipbreaker		H	with hole	Round hole / one countersink (70°-90°)	Chipbreaker on one side		G	with hole	Round hole	Chipbreaker on both sides		
T			Chipbreaker on one side		C		Round hole / double countersink (70°-90°)	Without chipbreaker		N		-	Without chipbreaker		
Q		Round hole / double countersink (40°-60°)	Without chipbreaker		J		Round hole	Round hole	Chipbreaker on both sides		R	without hole	-	Chipbreaker on one side	
U			Chipbreaker on both sides		A				Without chipbreaker		F		-	Chipbreaker on both sides	
B		Round hole / one countersink (70°-90°)	Without chipbreaker		M		Chipbreaker on one side		X	-	-	-	-	-	On request

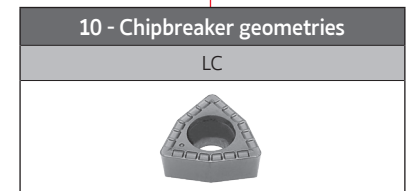
R's	35° V's	55° D's	80° C's	90° S's	60° T's	80° W's	Ø CI		ANSI
							mm	inch	Symbol
-	06	04	-	03	06	02	3,97	5/32	1,20
-	08	05	04	04	08	L3	4,76	3/16	1,50
-	09	06	05	05	09	03	5,56	7/32	1,80
06**	-	-	-	-	-	-	6,00	0,236	
06*	11	07	06	06	11	04	6,35	1/4	2,00
07*	13	09	08	07	13	05	7,94	5/16	2,50
08*	-	-	-	-	-	-	8,00	0,315	
09*	16	11	09	09	16	06	9,525	3/8	3,00
10**	-	-	-	-	-	-	10,00	0,394	
12**	-	-	-	-	-	-	12,00	0,472	
12*	22	15	12	12	22	08	12,70	1/2	4,00
15*	27	19	16	15	27	10	15,875	5/8	5,00
16**	-	-	-	-	-	-	16,00	0,63	
19*	33	23	19	19	33	13	19,05	3/4	6,00
20**	-	-	-	-	-	-	20,00	0,787	
25**	-	-	-	-	-	-	25,00	0,984	
25*	44	31	25	25	44	17	25,40	1,00	8,00
31*	54	38	32	31	54	21	31,75	1 1/4	10,00
32**	-	-	-	-	-	-	32,00	1,26	

\* ANSI designation only (Radius Designation is R00)  
 \*\* Metric designation only (Radius Designation is M0)  
 According to International Standard ISO 1832 - 2012(E)  
 "Indexable inserts for cutting tools - Designation"

ISO	mm	ANSI	inch
01	1.59	1	0.062
T1	1.98	1.2	0.078
02	2.38	1.5	0.094
03	3.18	2	0.125
T3	3.97	2.5	0.156
04	4.76	3	0.188
05	5.56	3.5	0.219
06	6.35	4	0.250
07	7.94	5	0.312
09	9.52	6	0.375
12	12.70	8	0.500

5 - Insert size symbol

6 - Insert thickness symbol



7 - Insert corner symbol			
ISO	mm	inch	ANSI
00	Sharp nose		0
01	0.10	.004	0.2
02	0.20	.008	0.5
04	0.40	.015	1
08	0.80	.032	2
12	1.2	.047	3
16	1.6	.062	4
20	2.0	.078	5
24	2.4	.094	6
28	2.8	.109	7
32	3.2	.125	8
00 (inch or M0/metric)	Round insert		0

7.1* - Insert edges symbol			
For inserts having secondary edges two digits are used:			
1 <sup>st</sup> digit is secondary edge		2 <sup>nd</sup> digit is secondary edges relief angle	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	special	F	25°
*only when required.		G	30°
		N	0°
		P	11°
		Z	special

8 - Cutting edge information		
Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfered with honing	S
*only when required.		

# INSERTS | Pastilhas | Plaquetas

## SPKX | Inserts | Pastilhas | Plaquetas



(1) Geometry code	ISO Reference	P			M			K		S			N	Dimensions Dimensões Dimensiones (in)			
		PVD			PVD			PVD		PVD			UNC	iC	S	d1	R
		68	66	J3	68	66	J3	68	66	68	66	J3	10				
1111281	SPKX 050204	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.197	0.094	0.087	0.016
1111282	SPKX 060204	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.236	0.094	0.100	0.016
1142099	SPHX 060204-LN												⊗	0.236	0.094	0.100	0.016
1111283	SPKX 07T308	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.313	0.156	0.112	0.031
1111284	SPKX 090408	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.386	0.169	0.161	0.031
1111285	SPKX 110408	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.453	0.189	0.173	0.031
1111286	SPKX 140512	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.563	0.205	0.226	0.047

⊗ Stock item | Produto de stock | Itens de stock      ○ Available under request | Disponível sobre consulta | Disponible bajo consulta      Insert order code = (1) Geometry Code + (2) Grade Code

Note: for inside inserts it is recommended to use grade PH6930 or PHC930

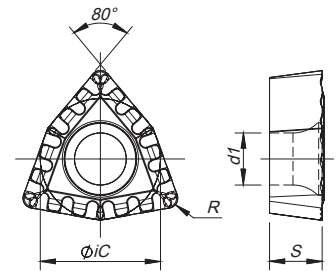
## WCKX | Inserts | Pastilhas | Plaquetas



(1) Geometry code	ISO Reference	P				M		K		S		Dimensions Dimensões Dimensiones (in)			
		PVD				PVD		CVD		PVD		iC	S	d1	R
		68	66	I5	78	68	66	68	66	68	66				
1140300	WCKX 02T104	⊗	⊗	○	○	⊗	⊗	⊗	⊗	⊗	⊗	0.187	0.078	0.079	0.016
1140276	WCKX 030204	⊗	⊗	○	○	⊗	⊗	⊗	⊗	⊗	⊗	0.219	0.094	0.100	0.016
1140277	WCKX 040204	⊗	⊗	○	○	⊗	⊗	⊗	⊗	⊗	⊗	0.250	0.094	0.112	0.016
1140278	WCKX 050308	⊗	⊗	○	○	⊗	⊗	⊗	⊗	⊗	⊗	0.313	0.125	0.138	0.031
1140279	WCKX 06T308	⊗	⊗	○	○	⊗	⊗	⊗	⊗	⊗	⊗	0.376	0.156	0.161	0.031
1140280	WCKX 080408	⊗	⊗	○	○	⊗	⊗	⊗	⊗	⊗	⊗	0.500	0.187	0.220	0.031

⊗ Stock item | Produto de stock | Itens de stock      ○ Available under request | Disponível sobre consulta | Disponible bajo consulta      Insert order code = (1) Geometry Code + (2) Grade Code

WCKX-LC for low carbon steels | Inserts | Pastilhas | Plaquetas



		P		Dimensions Dimensões Dimensiones (in)			
		PVD					
	<sup>(2)</sup> Grade code	68	66	iC	S	d1	R
<sup>(1)</sup> Geometry code	ISO Reference	PH6920	PH6930				
1142068	WCKX 050308-LC	⊗	⊗	0.313	0.125	0.138	0.031
1142069	WCKX 06T308-LC	⊗	⊗	0.376	0.156	0.161	0.031

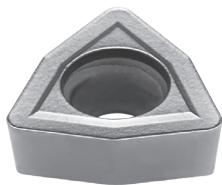
⊗ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

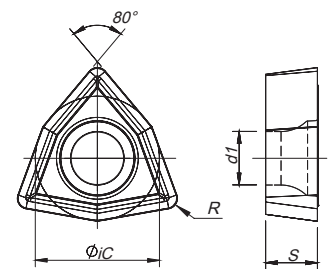
Insert order code = (1) Geometry Code + (2) Grade Code

WCMX | Inserts | Pastilhas | Plaquetas

ISO references for other drilling systems



(PHC grade)



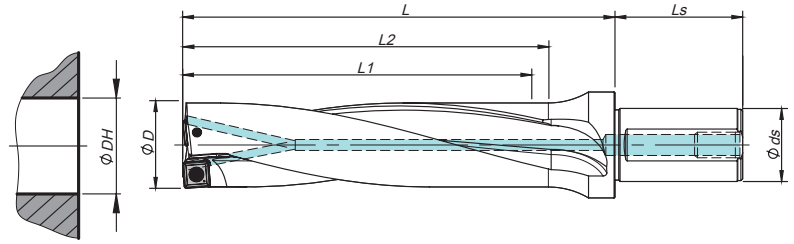
		P		M		K		S		Dimensions Dimensões Dimensiones (in)			
		PVD		PVD		PVD		PVD					
	<sup>(2)</sup> Grade code	68	J3	68	J3	68	J3	68	J3	iC	S	d1	R
<sup>(1)</sup> Geometry code	ISO Reference	PH6920	PHC930	PH6920	PHC930	PH6920	PHC930	PH6920	PHC930				
1120827	WCMX 030204	○	○	○	○	○	○	○	○	0.219	0.094	0.110	0.016
1120828	WCMX 030208	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.219	0.094	0.110	0.031
1120829	WCMX 040208	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.250	0.094	0.122	0.031
1120830	WCMX 050308	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.313	0.125	0.126	0.031
1120831	WCMX 06T308	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.375	0.156	0.146	0.031
1120832	WCMX 080408	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.500	0.187	0.169	0.031
1120833	WCMX 080412	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.500	0.187	0.169	0.047

⊗ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code
























Note: for inside inserts it is recommended to use grade PH6930 or PHC930





Øds	Ls	BP / SP
0.750	1.969	1/8 - 27 NPT
1.000	2.205	1/8 - 27 NPT
1.250	2.362	1/4 - 18 NPT
1.500	2.756	1/4 - 18 NPT

ØDH tolerance (in)	
ØD	3D
0.531 - 0.844	-0.004 / +0.006
0.875 - 1.938	-0.005 / +0.008

Order separately























Order code Código	Reference Referência Referencia	Dimensions   Dimensões   Dimensiones (in)					Insert	Screw	Torx key	Stock
		ØD	Ø ds	L1	L2	L				
184197900	SCI 07500531-3D	0.531	0.750	1.593	1.693	2.756	SPKX 050204	P0200500	XT06	
184198000	SCI 07500563-3D	0.563	0.750	1.689	1.811	2.874	SPKX 050204	P0200500	XT06	
184198100	SCI 07500594-3D	0.594	0.750	1.782	1.890	2.953	SPKX 050204	P0200500	XT06	
184198200	SCI 10000625-3D	0.625	1.000	1.875	2.008	3.189	SPKX 060204	P0220500	XT07	
184198300	SCI 10000656-3D	0.656	1.000	1.968	2.087	3.268	SPKX 060204	P0220500	XT07	
184198400	SCI 10000688-3D	0.688	1.000	2.064	2.165	3.346	SPKX 060204	P0220500	XT07	
184198500	SCI 10000703-3D	0.703	1.000	2.109	2.244	3.425	SPKX 060204	P0220500	XT07	
184198600	SCI 10000734-3D	0.734	1.000	2.202	2.323	3.504	SPKX 060204	P0220500	XT07	
184198700	SCI 10000750-3D	0.750	1.000	2.250	2.362	3.543	SPKX 060204	P0220500	XT07	
184198800	SCI 10000781-3D	0.781	1.000	2.343	2.480	3.661	SPKX 060204	P0220500	XT07	
184198900	SCI 10000813-3D	0.813	1.000	2.439	2.559	3.740	SPKX 060204	P0220500	XT07	
184199000	SCI 10000844-3D	0.844	1.000	2.532	2.638	3.819	SPKX 060204	P0220500	XT07	
184199100	SCI 12500875-3D	0.875	1.250	2.625	2.756	4.134	SPKX 07T308	P0250704	XT08	
184199200	SCI 12500906-3D	0.906	1.250	2.718	2.835	4.213	SPKX 07T308	P0250704	XT08	
184199300	SCI 12500938-3D	0.938	1.250	2.814	2.913	4.291	SPKX 07T308	P0250704	XT08	
184199400	SCI 12500969-3D	0.969	1.250	2.907	3.031	4.409	SPKX 07T308	P0250704	XT08	
184199500	SCI 12500984-3D	0.984	1.250	2.952	3.071	4.449	SPKX 07T308	P0250704	XT08	
184199600	SCI 12501000-3D	1.000	1.250	3.000	3.110	4.488	SPKX 07T308	P0250704	XT08	
184199700	SCI 12501031-3D	1.031	1.250	3.093	3.228	4.606	SPKX 07T308	P0250704	XT08	
184199800	SCI 12501063-3D	1.063	1.250	3.189	3.307	4.685	SPKX 07T308	P0250704	XT08	
184199900	SCI 12501094-3D	1.094	1.250	3.282	3.386	4.764	SPKX 07T308	P0250704	XT08	


 Stock item | Produto de stock | Itens de stock

 Available under request | Disponível sobre consulta  
Disponível bajo consulta



Order seperately

Order code Código	Reference Referência Referencia	Dimensions   Dimensões   Dimensiones (in)					Insert	Screw 	Torx key 	Stock
		ØD	Ø ds	L1	L2	L				
184200000	SCI 12501125-3D	1.125	1.250	3.375	3.504	4.882	SPKX 090408	P0350903	XT15	
184200100	SCI 12501156-3D	1.156	1.250	3.468	3.583	4.961	SPKX 090408	P0350903	XT15	
184200200	SCI 12501188-3D	1.188	1.250	3.564	3.701	5.079	SPKX 090408	P0350903	XT15	
184200300	SCI 12501219-3D	1.219	1.250	3.657	3.780	5.157	SPKX 090408	P0350903	XT15	
184200400	SCI 12501250-3D	1.250	1.250	3.750	3.858	5.236	SPKX 090408	P0350903	XT15	
184200500	SCI 12501281-3D	1.281	1.250	3.843	3.976	5.354	SPKX 090408	P0350903	XT15	
184200600	SCI 12501313-3D	1.313	1.250	3.939	4.055	5.433	SPKX 090408	P0350903	XT15	
184200700	SCI 15001375-3D	1.375	1.500	4.125	4.331	5.906	SPKX 110408	P0401200	XT15	
184200800	SCI 15001406-3D	1.406	1.500	4.218	4.409	5.984	SPKX 110408	P0401200	XT15	
184200900	SCI 15001438-3D	1.438	1.500	4.314	4.528	6.102	SPKX 110408	P0401200	XT15	
184201000	SCI 15001469-3D	1.469	1.500	4.407	4.606	6.181	SPKX 110408	P0401200	XT15	
184201100	SCI 15001500-3D	1.500	1.500	4.500	4.685	6.260	SPKX 110408	P0401200	XT15	
184201200	SCI 15001531-3D	1.531	1.500	4.593	4.803	6.378	SPKX 110408	P0401200	XT15	
184201300	SCI 15001563-3D	1.563	1.500	4.689	4.882	6.457	SPKX 110408	P0401200	XT15	
184201400	SCI 15001625-3D	1.625	1.500	4.875	5.079	6.654	SPKX 110408	P0401200	XT15	
184201500	SCI 15001688-3D	1.688	1.500	5.064	5.276	6.850	SPKX 140512	P0501300	XT20	
184201600	SCI 15001750-3D	1.750	1.500	5.250	5.433	7.008	SPKX 140512	P0501300	XT20	
184201700	SCI 15001813-3D	1.813	1.500	5.439	5.630	7.205	SPKX 140512	P0501300	XT20	
184201800	SCI 15001875-3D	1.875	1.500	5.625	5.827	7.402	SPKX 140512	P0501300	XT20	
184201900	SCI 15001938-3D	1.938	1.500	5.814	6.024	7.598	SPKX 140512	P0501300	XT20	

 Stock item | Produto de stock | Itens de stock

 Available under request | Disponível sobre consulta  
Disponível bajo consulta

DRILLING

DRILLING

Inserts

Jet Drill

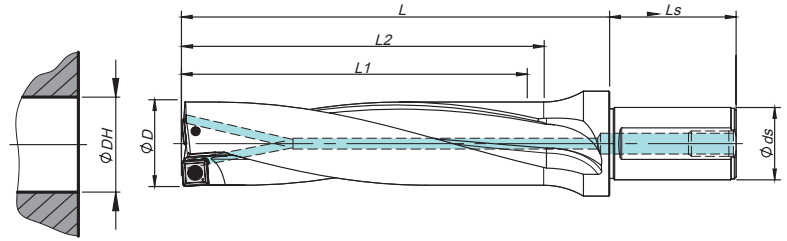
Vortex Drill

Solid Carbide Drills

Spare Parts

Technical Data

























DRILLING  
Inserts  
Jet Drill  
Vortex Drill  
Solid Carbide Drills  
Spare Parts  
Technical Data




Øds	Ls	BP / SP
0.750	1.969	1/8 - 27 NPT
1.250	2.205	1/8 - 27 NPT
1.500	2.362	1/4 - 18 NPT
1.500	2.756	1/4 - 18 NPT

ØDH tolerance (in)	
ØD	4D
0.531 - 0.844	-0.005 / +0.008
0.875 - 1.938	-0.005 / +0.010























Order separately


Order code Código	Reference Referência Referencia	Dimensions   Dimensões   Dimensiones (in)					Insert	Screw 	Torx key 	Stock 
		ØD	Ø ds	L1	L2	L				
184202000	SCI 07500531-4D	0.531	0.750	2.124	2.244	3.307	SPKX 050204	P0200500	XT06	
184202100	SCI 07500563-4D	0.563	0.750	2.252	2.362	3.425	SPKX 050204	P0200500	XT06	
184202200	SCI 07500594-4D	0.594	0.750	2.376	2.480	3.543	SPKX 050204	P0200500	XT06	
184202300	SCI 10000625-4D	0.625	1.000	2.500	2.638	3.819	SPKX 060204	P0220500	XT07	
184202400	SCI 10000656-4D	0.656	1.000	2.624	2.756	3.937	SPKX 060204	P0220500	XT07	
184202500	SCI 10000688-4D	0.688	1.000	2.752	2.874	4.055	SPKX 060204	P0220500	XT07	
184202600	SCI 10000703-4D	0.703	1.000	2.812	2.913	4.094	SPKX 060204	P0220500	XT07	
184202700	SCI 10000734-4D	0.734	1.000	2.936	3.071	4.252	SPKX 060204	P0220500	XT07	
184202800	SCI 10000750-4D	0.750	1.000	3.000	3.110	4.291	SPKX 060204	P0220500	XT07	
184202900	SCI 10000781-4D	0.781	1.000	3.124	3.228	4.409	SPKX 060204	P0220500	XT07	
184203000	SCI 10000813-4D	0.813	1.000	3.252	3.386	4.567	SPKX 060204	P0220500	XT07	
184203100	SCI 10000844-4D	0.844	1.000	3.376	3.504	4.685	SPKX 060204	P0220500	XT07	
184203200	SCI 12500875-4D	0.875	1.250	3.500	3.622	5.000	SPKX 07T308	P0250704	XT08	
184203300	SCI 12500906-4D	0.906	1.250	3.624	3.740	5.118	SPKX 07T308	P0250704	XT08	
184203400	SCI 12500938-4D	0.938	1.250	3.752	3.858	5.236	SPKX 07T308	P0250704	XT08	
184203500	SCI 12500969-4D	0.969	1.250	3.876	3.976	5.354	SPKX 07T308	P0250704	XT08	
184203600	SCI 12500984-4D	0.984	1.250	3.936	4.055	5.433	SPKX 07T308	P0250704	XT08	
184203700	SCI 12501000-4D	1.000	1.250	4.000	4.134	5.512	SPKX 07T308	P0250704	XT08	
184203800	SCI 12501031-4D	1.031	1.250	4.124	4.252	5.630	SPKX 07T308	P0250704	XT08	
184203900	SCI 12501063-4D	1.063	1.250	4.252	4.370	5.748	SPKX 07T308	P0250704	XT08	
184204000	SCI 12501094-4D	1.094	1.250	4.376	4.488	5.866	SPKX 07T308	P0250704	XT08	

 Stock item | Produto de stock | Itens de stock

 Available under request | Disponível sobre consulta  
Disponível bajo consulta

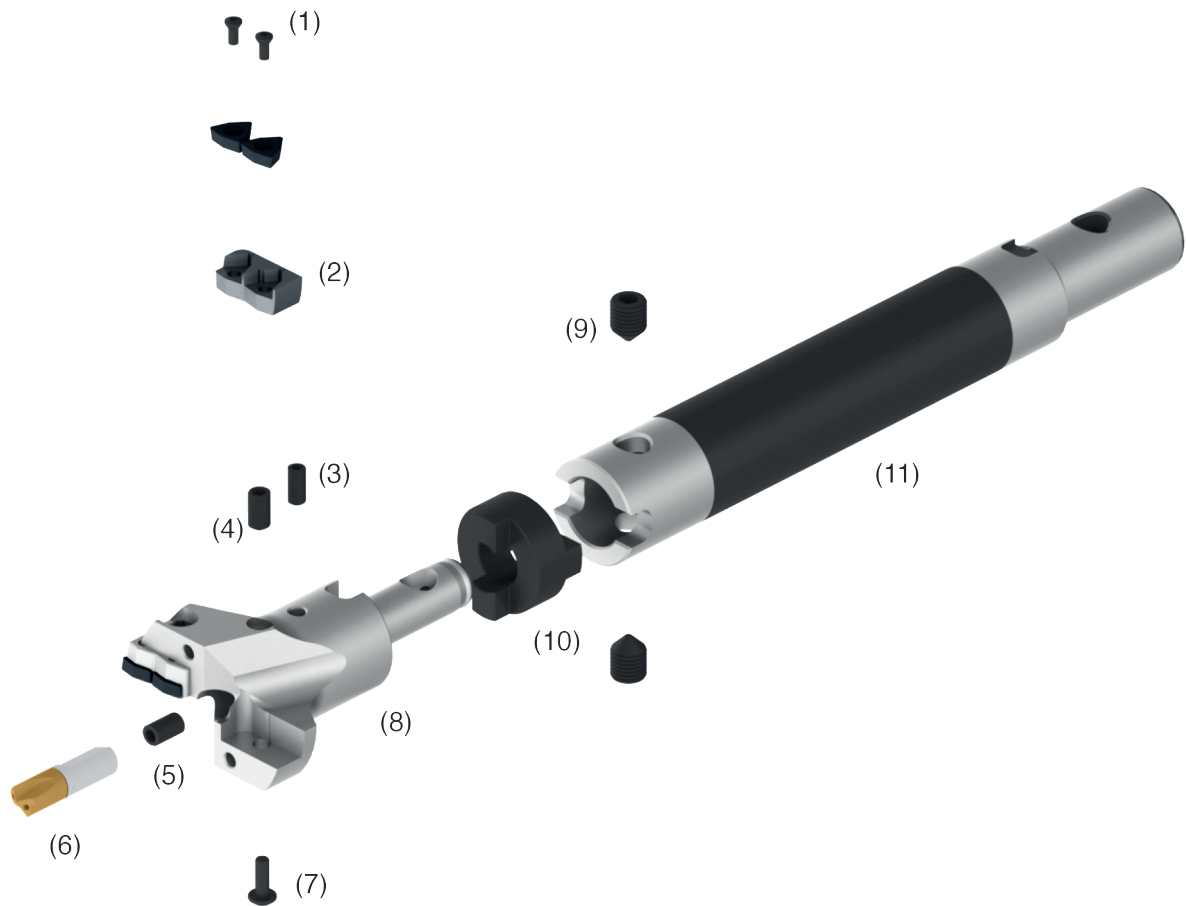
Order seperately

Order code Código	Reference Referência Referencia	Dimensions   Dimensões   Dimensiones (in)					Insert	Screw 	Torx key 	Stock
		ØD	Ø ds	L1	L2	L				
184204100	SCI 12501125-4D	1.125	1.250	4.500	4.606	5.984	SPKX 090408	P0350903	XT15	
184204200	SCI 12501156-4D	1.156	1.250	4.624	4.724	6.102	SPKX 090408	P0350903	XT15	
184204300	SCI 12501188-4D	1.188	1.250	4.752	4.882	6.260	SPKX 090408	P0350903	XT15	
184204400	SCI 12501219-4D	1.219	1.250	4.876	5.000	6.378	SPKX 090408	P0350903	XT15	
184204500	SCI 12501250-4D	1.250	1.250	5.000	5.118	6.496	SPKX 090408	P0350903	XT15	
184204600	SCI 12501281-4D	1.281	1.250	5.124	5.236	6.614	SPKX 090408	P0350903	XT15	
184204700	SCI 12501313-4D	1.313	1.250	5.252	5.354	6.732	SPKX 090408	P0350903	XT15	
184204800	SCI 15001375-4D	1.375	1.500	5.500	5.709	7.283	SPKX 110408	P0401200	XT15	
184204900	SCI 15001406-4D	1.406	1.500	5.624	5.827	7.402	SPKX 110408	P0401200	XT15	
184205000	SCI 15001438-4D	1.438	1.500	5.752	5.945	7.520	SPKX 110408	P0401200	XT15	
184205100	SCI 15001469-4D	1.469	1.500	5.876	6.063	7.638	SPKX 110408	P0401200	XT15	
184205200	SCI 15001500-4D	1.500	1.500	6.000	6.181	7.756	SPKX 110408	P0401200	XT15	
184205300	SCI 15001531-4D	1.531	1.500	6.124	6.339	7.913	SPKX 110408	P0401200	XT15	
184205400	SCI 15001563-4D	1.563	1.500	6.252	6.457	8.031	SPKX 110408	P0401200	XT15	
184205500	SCI 15001625-4D	1.625	1.500	6.500	6.693	8.268	SPKX 110408	P0401200	XT15	
184205600	SCI 15001688-4D	1.688	1.500	6.752	6.969	8.543	SPKX 140512	P0501300	XT20	
184205700	SCI 15001750-4D	1.750	1.500	7.000	7.205	8.780	SPKX 140512	P0501300	XT20	
184205800	SCI 15001813-4D	1.813	1.500	7.252	7.441	9.016	SPKX 140512	P0501300	XT20	
184205900	SCI 15001875-4D	1.875	1.500	7.500	7.717	9.291	SPKX 140512	P0501300	XT20	
184206000	SCI 15001938-4D	1.938	1.500	7.752	7.953	9.528	SPKX 140512	P0501300	XT20	

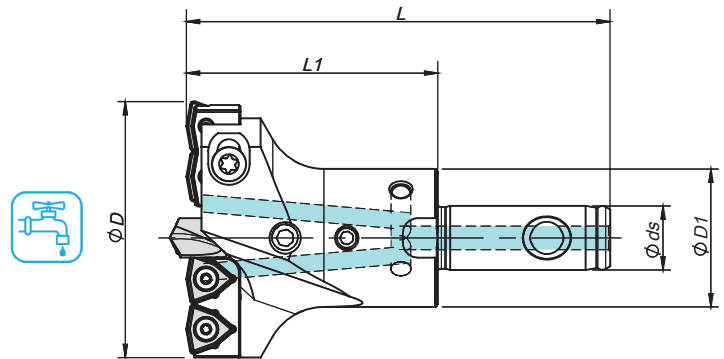
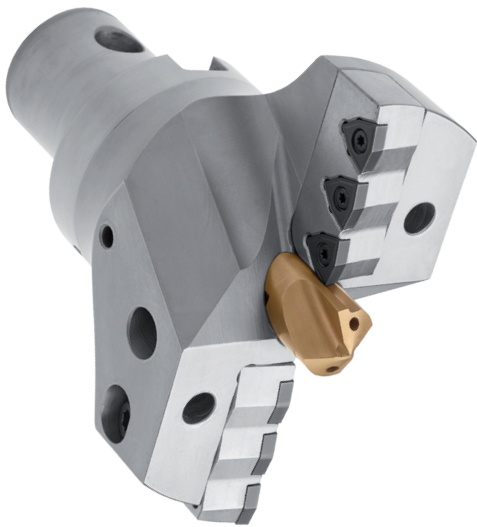
 Stock item | Produto de stock | Itens de stock

 Available under request | Disponível sobre consulta  
Disponível bajo consulta

DRILLING  
Inserts  
Jet Drill  
Vortex Drill  
Solid Carbide Drills  
Spare Parts  
Technical Data



- (1) - Insert Screw
- (2) - Cartridge Inner / Outer
- (3) - Fixing Screw for Pilot Drill
- (4) - Clamping Bolt for Pilot Drill
- (5) - Adjustment Screw for Pilot Drill
- (6) - Pilot Drill
- (7) - Screw for cartridge
- (8) - Vortex Drill
- (9) - Fixation Screw
- (10) - Drive Ring
- (11) - MSD Shank or MDE Extension



Order code Código	Reference Referência	Dimensions   Dimensões Dimensiones (mm)					Cartridge	Insert	Insert Screw	Torx key	Order separately Pilot drill	Stock
		ØD	Ø ds	L1	L	ØD1						

2 INSERTS PER CARTRIDGE

184031000	MDO 04505013	45-50	13	50	85	28	MDC 045050-I/O	WCKX 030204	P0220500	XT07	MDP 3510	☉
184031100	MDO 05005513	50-55	13	50	85	28	MDC 050055-I/O	WCKX 030204	P0220500	XT07	MDP 3510	☉
184031200	MDO 05506016	55-60	16	60	100	32	MDC 055060-I/O	WCKX 040204	P0250503	XT08	MDP 3812	☉
184031300	MDO 06006516	60-65	16	60	100	32	MDC 060065-I/O	WCKX 050308	P0300701	XT08	MDP 3812	☉
184031500	MDO 06507016	65-70	16	60	100	32	MDC 065070-I/O	WCKX 050308	P0300701	XT08	MDP 3812	☉
184032400	MDO 07007522	70-75	22	70	115	40	MDC 070075-I/O	WCKX 050308	P0300701	XT08	MDP 3812	☉
184032500	MDO 07508022	75-80	22	70	115	40	MDC 075080-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	☉
184032600	MDO 08008522	80-85	22	70	115	40	MDC 080085-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	☉
184032700	MDO 08509027	85-90	27	70	120	48	MDC 085090-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	☉
184032800	MDO 09009527	90-95	27	70	120	48	MDC 090095-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	☉
184032900	MDO 09510027	95-100	27	70	120	48	MDC 095100-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	☉

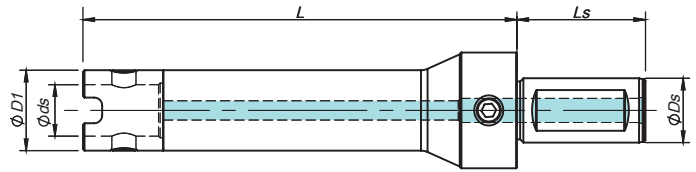
3 INSERTS PER CARTRIDGE

184033000	MDO 10010532	100-105	32	80	130	58	MDC 100105-I/O	WCKX 050308	P0300701	XT08	MDP 4520	☉
184066400	MDO 10511032	105-110	32	80	130	58	MDC 105110-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	☉
184066500	MDO 11011532	110-115	32	80	130	58	MDC 110115-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	☉
184066600	MDO 11512040	115-120	40	90	145	70	MDC 115120-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	☉
184066700	MDO 12012540	120-125	40	90	145	70	MDC 120125-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	☉
184066800	MDO 12513040	125-130	40	90	145	70	MDC 125130-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	☉
184066900	MDO 13013540	130-135	40	90	145	70	MDC 130135-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	☉
184067000	MDO 13514040	135-140	40	90	145	70	MDC 135140-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	☉
184067100	MDO 14015050	140-150	50	100	160	80	MDC 140150-I/O	WCKX 080408	P0401101	XT15	MDP 5625	☉
184067200	MDO 15016050	150-160	50	100	160	80	MDC 150160-I/O	WCKX 080408	P0401101	XT15	MDP 5625	☉
184067300	MDO 16017050	160-170	50	100	160	80	MDC 160170-I/O	WCKX 080408	P0401101	XT15	MDP 6830	☉
184067400	MDO 17018050	170-180	50	100	160	80	MDC 170180-I/O	WCKX 080408	P0401101	XT15	MDP 6830	☉

☉ Stock item | Produto de stock | Itens de stock      ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Drills with larger diameter available under request with a minimum order quantity.  
**Note: This type of drills are supplied without pilot drills. Please order them separately.**  
 Please see Page B - 280 for setting pilot drill.


Vortex drill Accessories | Acessórios de broca vortex | Accesorios de broca vortex



New version / Standard version\*

Øds	Ls	BP / SP
32	70	PT - 1/4
40	80	PT - 1/4
50	80 / 100	PT - 1/4

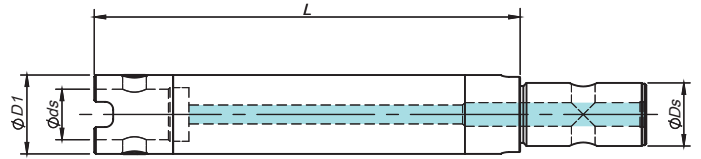
Order separately

Order code Código	Reference Referência Referencia	Dimensions   Dimensões   Dimensiones (mm)				Drive Ring 	Stock
		ØDs	Øds	ØD1	L		
184121900	MDS 32115130	32	13	28	115	MDR 1028	☉
184253700	MDS 32200130	32	13	28	200	MDR 1028	☉
184255400	MDS 32300130	32	13	28	300	MDR 1028	☉
184122100	MDS 40125160	40	16	32	125	MDR 1032	☉
184253800	MDS 40200160	40	16	32	200	MDR 1032	☉
184255500	MDS 40300160	40	16	32	300	MDR 1032	☉
184122300	MDS 40148220	40	22	40	148	MDR 1240	☉
184122400	MDS 40200220	40	22	40	200	MDR 1240	☉
184122500	MDS 40300220	40	22	40	300	MDR 1240	☉
184122600	MDS 40168270	40	27	48	168	MDR 1248	☉
184122700	MDS 40300270	40	27	48	300	MDR 1248	☉
184122800	MDS 40186320	40	32	58	186	MDR 1458	☉
184122900	MDS 40300320	40	32	58	300	MDR 1458	☉
184123000	MDS 50186400	50	40	70	186	MDR 1470	☉
184123100	MDS 50300400	50	40	70	300	MDR 1470	☉
184123200	MDS 50184500	50	50	80	184	MDR 1680	☉
184123300	MDS 50300500	50	50	80	300	MDR 1680	☉


☉ Stock item | Produto de stock | Itens de stock      ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: This shanks type are supplied without drive ring. Please order them separately.

Vortex drill Accessories | Acessórios de broca vortex | Accesorios de broca vortex



Order separately

Order code Código	Reference Referência Referencia	Dimensions   Dimensões   Dimensiones (mm)				Drive Ring 	Stock
		ØDs	Øds	ØD1	L		
184023500	MDE 13115280	13	13	28	115	MDR 1028	⊗
184023600	MDE 13150280	13	13	28	150	MDR 1028	⊗
184023700	MDE 13200280	13	13	28	200	MDR 1028	⊗
184021800	MDE 13300280	13	13	28	300	MDR 1028	⊗
184023800	MDE 16115320	16	16	32	115	MDR 1032	⊗
184021900	MDE 16200320	16	16	32	200	MDR 1032	⊗
184023900	MDE 16300320	16	16	32	300	MDR 1032	⊗
184024000	MDE 22113400	22	22	40	113	MDR 1240	⊗
184024100	MDE 22200400	22	22	40	200	MDR 1240	⊗
184024200	MDE 22300400	22	22	40	300	MDR 1240	⊗
184024300	MDE 27113480	27	27	48	113	MDR 1248	⊗
184024400	MDE 27200480	27	27	48	200	MDR 1248	⊗
184024500	MDE 27300480	27	27	48	300	MDR 1248	⊗
184024600	MDE 32186580	32	32	58	186	MDR 1458	⊗
184024700	MDE 32300580	32	32	58	300	MDR 1458	⊗
184024800	MDE 40186700	40	40	70	186	MDR 1470	⊗
184024900	MDE 40300700	40	40	70	300	MDR 1470	⊗
184025000	MDE 40500700	40	40	70	500	MDR 1470	⊗
184025100	MDE 50204800	50	50	80	204	MDR 1680	⊗
184025200	MDE 50300800	50	50	80	300	MDR 1680	⊗
184025300	MDE 50500800	50	50	80	500	MDR 1680	⊗

⊗ Stock item | Produto de stock | Itens de stock      ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: This shanks type are supplied without drive ring. Please order them separately.

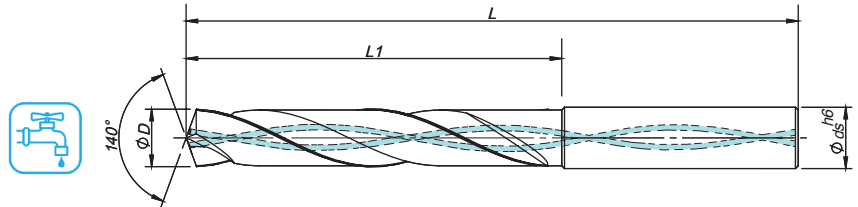


# SOLID CARBIDE DRILLS WITH COOLANT

Brocas de metal duro com refrigeração | Brocas en metal duro con refrigeração

P K

HRC ≤ 60 | 48  
IT8-9 IT class



Order code Código	Reference Referência Referencia		Dimensions   Dimensões   Dimensiones				Tolerances Tolerâncias Tolerancias	HRC	PHU920
			ØD (in)	Ø ds (mm)	L1 (in)	L (in)			
<b>3D</b>									
1181642Z9	HBDPCE 2 03Di 0318-060020	2	1/8	6,0	0.787	2.362	+0.016/+0.004	≤ 60	
1181643Z9	HBDPCE 2 03Di 0635-075034	2	1/4	8,0	1.339	2.953	+0.021/+0.006		
1181644Z9	HBDPCE 2 03Di 0953-090047	2	3/8	10,0	1.850	3.543	+0.021/+0.006		
1181645Z9	HBDPCE 2 03Di 1270-100060	2	1/2	14,0	2.362	3.937	+0.025/+0.007		
1181646Z9	HBDPCE 2 03Di 1588-108065	2	5/8	16,0	2.559	4.252	+0.025/+0.007		
1181647Z9	HBDPCE 2 03Di 1905-120079	2	3/4	20,0	3.110	4.724	+0.029/+0.008		
<b>5D</b>									
1181648Z9	HBDPCE 2 05Di 0318-075028	2	1/8	6,0	1.102	2.953	+0.016/+0.004	≤ 60	
1181649Z9	HBDPCE 2 05Di 0635-092053	2	1/4	8,0	2.087	3.622	+0.021/+0.006		
1181650Z9	HBDPCE 2 05Di 0953-105061	2	3/8	10,0	2.402	4.134	+0.021/+0.006		
1181651Z9	HBDPCE 2 05Di 1270-126077	2	1/2	14,0	3.031	4.961	+0.025/+0.007		
1181652Z9	HBDPCE 2 05Di 1588-135083	2	5/8	16,0	3.268	5.315	+0.025/+0.007		
1181653Z9	HBDPCE 2 05Di 1905-156101	2	3/4	20,0	3.976	6.142	+0.029/+0.008		
<b>8D</b>									
1181654Z9	HBDPCE 2 08Di 0318-083040	2	1/8	6,0	1.339	2.835	+0.016/+0.004	≤ 48	
1181655Z9	HBDPCE 2 08Di 0635-105067	2	1/4	8,0	2.992	4.488	+0.021/+0.006		
1181656Z9	HBDPCE 2 08Di 0953-135092	2	3/8	10,0	3.740	5.591	+0.021/+0.006		
1181657Z9	HBDPCE 2 08Di 1270-163128	2	1/2	14,0	4.488	6.378	+0.025/+0.007		
1181658Z9	HBDPCE 2 08Di 1588-197146	2	5/8	16,0	5.748	7.756	+0.025/+0.007		

Available soon in the USA | Disponível em breve nos EUA | Disponible pronto en los EE. UU.

# SOLID CARBIDE DRILLS WITHOUT COOLANT

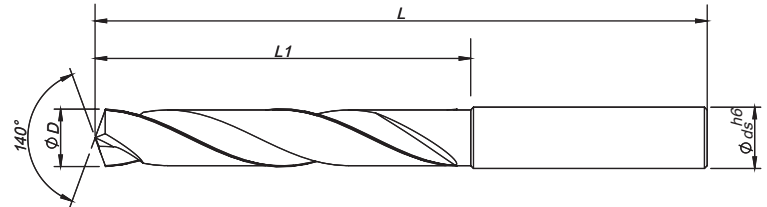


Brocas de metal duro sem refrigeração | Brocas en metal duro sin refrigeración

P K

HRC ≤ 60 | 48

IT8-9 IT class



Order code Código	Reference Referência Referencia		Dimensions   Dimensões   Dimensiones				Tolerances Tolerâncias Tolerancias	HRC	PHU920
			ØD (in)	Ø ds (mm)	L1 (in)	L (in)			
<b>3D</b>									
1181659Z9	HBDPUE 2 03Di 0318-060020	2	1/8	6,0	0.787	2.362	+0.016/+0.004	≤ 60	
1181660Z9	HBDPUE 2 03Di 0635-075034	2	1/4	8,0	1.339	2.953	+0.021/+0.006		
1181661Z9	HBDPUE 2 03Di 0953-090047	2	3/8	10,0	1.850	3.543	+0.021/+0.006		
1181662Z9	HBDPUE 2 03Di 1270-100060	2	1/2	14,0	2.362	3.937	+0.025/+0.007		
1181663Z9	HBDPUE 2 03Di 1588-110065	2	5/8	16,0	2.559	4.331	+0.025/+0.007		
1181664Z9	HBDPUE 2 03Di 1905-120079	2	3/4	20,0	3.110	4.724	+0.029/+0.008		
<b>5D</b>									
1181665Z9	HBDPUE 2 05Di 0318-075028	2	1/8	6,0	1.102	2.953	+0.016/+0.004	≤ 60	
1181666Z9	HBDPUE 2 05Di 0635-092053	2	1/4	8,0	2.087	3.622	+0.021/+0.006		
1181667Z9	HBDPUE 2 05Di 0953-100061	2	3/8	10,0	2.402	3.937	+0.021/+0.006		
1181668Z9	HBDPUE 2 05Di 1270-126077	2	1/2	14,0	3.031	4.961	+0.025/+0.007		
1181669Z9	HBDPUE 2 05Di 1588-135083	2	5/8	16,0	3.268	5.315	+0.025/+0.007		
1181670Z9	HBDPUE 2 05Di 1905-156101	2	3/4	20,0	3.976	6.142	+0.029/+0.008		

Available soon in the USA | Disponível em breve nos EUA | Disponible pronto en los EE. UU.

DRILLING

Inserts

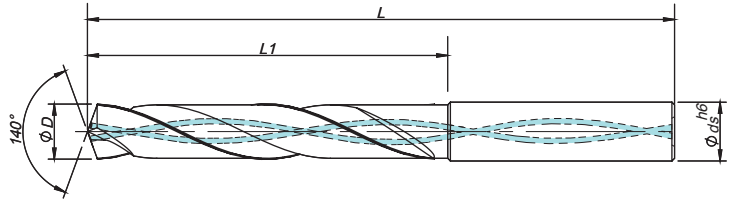
Jet Drill

Vortex Drill

Solid Carbide Drills

Spare Parts

Technical Data



P	K
HRC ≤ 60	IT8-9 IT class

Drill Dia. ØD	ØD3,0	3,0<ØD≤6,0	6,0<ØD≤10,0	10,0<ØD≤18,0	18,0<ØD≤20,0
Hole Tolerances	+0,002	+0,004	+0,006	+0,007	+0,008
	+0,012	+0,016	+0,021	+0,025	+0,028

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180956Z9	HBDPCE 2 03D 0300-062020	3	6	20	62	2	⊗
1180957Z9	HBDPCE 2 03D 0310-062020	3,1	6	20	62	2	⊗
1180958Z9	HBDPCE 2 03D 0320-062020	3,2	6	20	62	2	⊗
1180959Z9	HBDPCE 2 03D 0330-062020	3,3	6	20	62	2	⊗
1180960Z9	HBDPCE 2 03D 0340-062020	3,4	6	20	62	2	⊗
1180961Z9	HBDPCE 2 03D 0350-062020	3,5	6	20	62	2	⊗
1180962Z9	HBDPCE 2 03D 0360-062020	3,6	6	20	62	2	○
1180963Z9	HBDPCE 2 03D 0370-062020	3,7	6	20	62	2	○
1180964Z9	HBDPCE 2 03D 0380-066024	3,8	6	24	66	2	○
1180965Z9	HBDPCE 2 03D 0390-066024	3,9	6	24	66	2	○
1180966Z9	HBDPCE 2 03D 0400-066024	4	6	24	66	2	⊗
1180967Z9	HBDPCE 2 03D 0410-066024	4,1	6	24	66	2	○
1180968Z9	HBDPCE 2 03D 0420-066024	4,2	6	24	66	2	⊗
1180969Z9	HBDPCE 2 03D 0430-066024	4,3	6	24	66	2	○
1180970Z9	HBDPCE 2 03D 0440-066024	4,4	6	24	66	2	○
1180971Z9	HBDPCE 2 03D 0450-066024	4,5	6	24	66	2	○
1180972Z9	HBDPCE 2 03D 0460-066024	4,6	6	24	66	2	⊗
1180973Z9	HBDPCE 2 03D 0470-066024	4,7	6	24	66	2	○
1180974Z9	HBDPCE 2 03D 0480-066028	4,8	6	28	66	2	○
1180975Z9	HBDPCE 2 03D 0490-066028	4,9	6	28	66	2	○
1180976Z9	HBDPCE 2 03D 0500-066028	5	6	28	66	2	⊗
1180977Z9	HBDPCE 2 03D 0510-066028	5,1	6	28	66	2	○

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180978Z9	HBDPCE 2 03D 0520-066028	5,2	6	28	66	2	○
1180979Z9	HBDPCE 2 03D 0530-066028	5,3	6	28	66	2	○
1180980Z9	HBDPCE 2 03D 0540-066028	5,4	6	28	66	2	○
1180981Z9	HBDPCE 2 03D 0550-066028	5,5	6	28	66	2	○
1180982Z9	HBDPCE 2 03D 0560-066028	5,6	6	28	66	2	⊗
1180983Z9	HBDPCE 2 03D 0570-066028	5,7	6	28	66	2	○
1180984Z9	HBDPCE 2 03D 0580-066028	5,8	6	28	66	2	○
1180985Z9	HBDPCE 2 03D 0590-066028	5,9	6	28	66	2	○
1180986Z9	HBDPCE 2 03D 0600-066028	6	6	28	66	2	⊗
1180987Z9	HBDPCE 2 03D 0610-079034	6,1	8	34	79	2	○
1180988Z9	HBDPCE 2 03D 0620-079034	6,2	8	34	79	2	○
1180989Z9	HBDPCE 2 03D 0630-079034	6,3	8	34	79	2	○
1180990Z9	HBDPCE 2 03D 0640-079034	6,4	8	34	79	2	○
1180991Z9	HBDPCE 2 03D 0650-079034	6,5	8	34	79	2	⊗
1180792Z9	HBDPCE 2 03D 0660-079034	6,6	8	34	79	2	○
1180992Z9	HBDPCE 2 03D 0670-079034	6,7	8	34	79	2	○
1180993Z9	HBDPCE 2 03D 0680-079034	6,8	8	34	79	2	⊗
1180994Z9	HBDPCE 2 03D 0690-079034	6,9	8	34	79	2	○
1180995Z9	HBDPCE 2 03D 0700-079034	7	8	34	79	2	⊗
1180996Z9	HBDPCE 2 03D 0710-079041	7,1	8	41	79	2	○
1180997Z9	HBDPCE 2 03D 0720-079041	7,2	8	41	79	2	○
1180998Z9	HBDPCE 2 03D 0730-079041	7,3	8	41	79	2	○

⊗ Stock item | Produto de stock | Itens de stock      ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180999Z9	HBDPCE 2 03D 0740-079041	7,4	8	41	79	2	○
1181000Z9	HBDPCE 2 03D 0750-079041	7,5	8	41	79	2	○
1181001Z9	HBDPCE 2 03D 0760-079041	7,6	8	41	79	2	○
1181002Z9	HBDPCE 2 03D 0770-079041	7,7	8	41	79	2	○
1181003Z9	HBDPCE 2 03D 0780-079041	7,8	8	41	79	2	○
1181004Z9	HBDPCE 2 03D 0790-079041	7,9	8	41	79	2	○
1181005Z9	HBDPCE 2 03D 0800-079041	8	8	41	79	2	⊗
1181006Z9	HBDPCE 2 03D 0810-089047	8,1	10	47	89	2	○
1181007Z9	HBDPCE 2 03D 0820-089047	8,2	10	47	89	2	○
1181008Z9	HBDPCE 2 03D 0830-089047	8,3	10	47	89	2	○
1181009Z9	HBDPCE 2 03D 0840-089047	8,4	10	47	89	2	○
1181010Z9	HBDPCE 2 03D 0850-089047	8,5	10	47	89	2	○
1181011Z9	HBDPCE 2 03D 0860-089047	8,6	10	47	89	2	○
1181012Z9	HBDPCE 2 03D 0870-089047	8,7	10	47	89	2	○
1181013Z9	HBDPCE 2 03D 0880-089047	8,8	10	47	89	2	○
1181014Z9	HBDPCE 2 03D 0890-089047	8,9	10	47	89	2	○
1181015Z9	HBDPCE 2 03D 0900-089047	9	10	47	89	2	⊗
1181016Z9	HBDPCE 2 03D 0910-089047	9,1	10	47	89	2	○
1181017Z9	HBDPCE 2 03D 0920-089047	9,2	10	47	89	2	○
1181018Z9	HBDPCE 2 03D 0930-089047	9,3	10	47	89	2	○
1181019Z9	HBDPCE 2 03D 0940-089047	9,4	10	47	89	2	○
1181020Z9	HBDPCE 2 03D 0950-089047	9,5	10	47	89	2	○
1181021Z9	HBDPCE 2 03D 0960-089047	9,6	10	47	89	2	○
1181022Z9	HBDPCE 2 03D 0970-089047	9,7	10	47	89	2	○
1181023Z9	HBDPCE 2 03D 0980-089047	9,8	10	47	89	2	○
1181024Z9	HBDPCE 2 03D 0990-089047	9,9	10	47	89	2	○
1181025Z9	HBDPCE 2 03D 1000-089047	10	10	47	89	2	⊗
1181026Z9	HBDPCE 2 03D 1010-102055	10,1	12	55	102	2	○
1181027Z9	HBDPCE 2 03D 1020-102055	10,2	12	55	102	2	⊗
1181028Z9	HBDPCE 2 03D 1030-102055	10,3	12	55	102	2	○
1181029Z9	HBDPCE 2 03D 1040-102055	10,4	12	55	102	2	○
1181030Z9	HBDPCE 2 03D 1050-102055	10,5	12	55	102	2	○
1181031Z9	HBDPCE 2 03D 1060-102055	10,6	12	55	102	2	○
1181032Z9	HBDPCE 2 03D 1070-102055	10,7	12	55	102	2	○
1181033Z9	HBDPCE 2 03D 1080-102055	10,8	12	55	102	2	○
1181034Z9	HBDPCE 2 03D 1090-102055	10,9	12	55	102	2	○
1181035Z9	HBDPCE 2 03D 1100-102055	11	12	55	102	2	⊗
1181036Z9	HBDPCE 2 03D 1110-102055	11,1	12	55	102	2	○
1181037Z9	HBDPCE 2 03D 1120-102055	11,2	12	55	102	2	○
1181038Z9	HBDPCE 2 03D 1130-102055	11,3	12	55	102	2	○
1181039Z9	HBDPCE 2 03D 1140-102055	11,4	12	55	102	2	○
1181040Z9	HBDPCE 2 03D 1150-102055	11,5	12	55	102	2	○
1181041Z9	HBDPCE 2 03D 1160-102055	11,6	12	55	102	2	○
1181042Z9	HBDPCE 2 03D 1170-102055	11,7	12	55	102	2	○
1181043Z9	HBDPCE 2 03D 1180-102055	11,8	12	55	102	2	○

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181044Z9	HBDPCE 2 03D 1190-102055	11,9	12	55	102	2	○
1181045Z9	HBDPCE 2 03D 1200-102055	12	12	55	102	2	⊗
1181046Z9	HBDPCE 2 03D 1250-107060	12,5	14	60	107	2	⊗
1181047Z9	HBDPCE 2 03D 1300-107060	13	14	60	107	2	○
1181048Z9	HBDPCE 2 03D 1350-107060	13,5	14	60	107	2	○
1181049Z9	HBDPCE 2 03D 1400-107060	14	14	60	107	2	⊗
1181050Z9	HBDPCE 2 03D 1450-115065	14,5	16	65	115	2	⊗
1181051Z9	HBDPCE 2 03D 1500-115065	15	16	65	115	2	⊗
1181052Z9	HBDPCE 2 03D 1550-115065	15,5	16	65	115	2	○
1181053Z9	HBDPCE 2 03D 1600-115065	16	16	65	115	2	○
1181054Z9	HBDPCE 2 03D 1650-123073	16,5	18	73	123	2	○
1181055Z9	HBDPCE 2 03D 1700-123073	17	18	73	123	2	○
1181056Z9	HBDPCE 2 03D 1750-123073	17,5	18	73	123	2	○
1181057Z9	HBDPCE 2 03D 1800-123073	18	18	73	123	2	○
1181058Z9	HBDPCE 2 03D 1850-131079	18,5	20	79	131	2	○
1181059Z9	HBDPCE 2 03D 1900-131079	19	20	79	131	2	○
1181060Z9	HBDPCE 2 03D 1950-131079	19,5	20	79	131	2	○
1181061Z9	HBDPCE 2 03D 2000-131079	20	20	79	131	2	○

⊗ Stock item | Produto de stock  
Itens de stock

○ Available under request | Disponível sobre consulta  
Disponível bajo consulta

DRILLING

DRILLING

Inserts

Jet Drill

Vortex Drill

Solid Carbide Drills

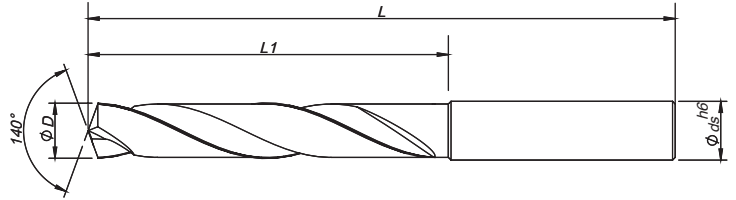
Spare Parts

Technical Data



P K

HRC ≤ 60  
IT8-9 IT class



Drill Dia. ØD	ØD3,0	3,0<ØD≤6,0	6,0<ØD≤10,0	10,0<ØD≤18,0	18,0<ØD≤20,0
Hole Tolerances	+0,002	+0,004	+0,006	+0,007	+0,008
	+0,012	+0,016	+0,021	+0,025	+0,028

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180784Z9	HBDPUE 2 03D 0300-062020	3	6	20	62	2	○
1180852Z9	HBDPUE 2 03D 0310-062020	3,1	6	20	62	2	○
1180853Z9	HBDPUE 2 03D 0320-062020	3,2	6	20	62	2	○
1180854Z9	HBDPUE 2 03D 0330-062020	3,3	6	20	62	2	○
1180790Z9	HBDPUE 2 03D 0340-062020	3,4	6	20	62	2	○
1180855Z9	HBDPUE 2 03D 0350-062020	3,5	6	20	62	2	○
1180856Z9	HBDPUE 2 03D 0360-062020	3,6	6	20	62	2	○
1180857Z9	HBDPUE 2 03D 0370-062020	3,7	6	20	62	2	○
1180858Z9	HBDPUE 2 03D 0380-066024	3,8	6	24	66	2	○
1180859Z9	HBDPUE 2 03D 0390-066024	3,9	6	24	66	2	○
1180860Z9	HBDPUE 2 03D 0400-066024	4	6	24	66	2	○
1180861Z9	HBDPUE 2 03D 0410-066024	4,1	6	24	66	2	○
1180862Z9	HBDPUE 2 03D 0420-066024	4,2	6	24	66	2	○
1180863Z9	HBDPUE 2 03D 0430-066024	4,3	6	24	66	2	○
1180864Z9	HBDPUE 2 03D 0440-066024	4,4	6	24	66	2	○
1180865Z9	HBDPUE 2 03D 0450-066024	4,5	6	24	66	2	○
1180866Z9	HBDPUE 2 03D 0460-066024	4,6	6	24	66	2	○
1180867Z9	HBDPUE 2 03D 0470-066024	4,7	6	24	66	2	○
1180868Z9	HBDPUE 2 03D 0480-066028	4,8	6	28	66	2	○
1180869Z9	HBDPUE 2 03D 0490-066028	4,9	6	28	66	2	○
1180870Z9	HBDPUE 2 03D 0500-066028	5	6	28	66	2	○
1180871Z9	HBDPUE 2 03D 0510-066028	5,1	6	28	66	2	○

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180872Z9	HBDPUE 2 03D 0520-066028	5,2	6	28	66	2	○
1180873Z9	HBDPUE 2 03D 0530-066028	5,3	6	28	66	2	○
1180874Z9	HBDPUE 2 03D 0540-066028	5,4	6	28	66	2	○
1180875Z9	HBDPUE 2 03D 0550-066028	5,5	6	28	66	2	○
1180791Z9	HBDPUE 2 03D 0560-066028	5,6	6	28	66	2	○
1180876Z9	HBDPUE 2 03D 0570-066028	5,7	6	28	66	2	○
1180877Z9	HBDPUE 2 03D 0580-066028	5,8	6	28	66	2	○
1180878Z9	HBDPUE 2 03D 0590-066028	5,9	6	28	66	2	○
1180879Z9	HBDPUE 2 03D 0600-066028	6	6	28	66	2	○
1180880Z9	HBDPUE 2 03D 0610-079034	6,1	8	34	79	2	○
1180881Z9	HBDPUE 2 03D 0620-079034	6,2	8	34	79	2	○
1180882Z9	HBDPUE 2 03D 0630-079034	6,3	8	34	79	2	○
1180883Z9	HBDPUE 2 03D 0640-079034	6,4	8	34	79	2	○
1180884Z9	HBDPUE 2 03D 0650-079034	6,5	8	34	79	2	○
1180885Z9	HBDPUE 2 03D 0660-079034	6,6	8	34	79	2	○
1180886Z9	HBDPUE 2 03D 0670-079034	6,7	8	34	79	2	○
1180887Z9	HBDPUE 2 03D 0680-079034	6,8	8	34	79	2	○
1180888Z9	HBDPUE 2 03D 0690-079034	6,9	8	34	79	2	○
1180889Z9	HBDPUE 2 03D 0700-079034	7	8	34	79	2	○
1180890Z9	HBDPUE 2 03D 0710-079041	7,1	8	41	79	2	○
1180891Z9	HBDPUE 2 03D 0720-079041	7,2	8	41	79	2	○
1180892Z9	HBDPUE 2 03D 0730-079041	7,3	8	41	79	2	○

Stock item | Produto de stock | Available under request | Disponível sobre consulta  
Itens de stock | Disponible bajo consulta

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180893Z9	HBDPUE 2 03D 0740-079041	7,4	8	41	79	2	○
1180894Z9	HBDPUE 2 03D 0750-079041	7,5	8	41	79	2	○
1180895Z9	HBDPUE 2 03D 0760-079041	7,6	8	41	79	2	○
1180896Z9	HBDPUE 2 03D 0770-079041	7,7	8	41	79	2	○
1180897Z9	HBDPUE 2 03D 0780-079041	7,8	8	41	79	2	○
1180898Z9	HBDPUE 2 03D 0790-079041	7,9	8	41	79	2	○
1180899Z9	HBDPUE 2 03D 0800-079041	8	8	41	79	2	○
1180900Z9	HBDPUE 2 03D 0810-089047	8,1	10	47	89	2	○
1180901Z9	HBDPUE 2 03D 0820-089047	8,2	10	47	89	2	○
1180902Z9	HBDPUE 2 03D 0830-089047	8,3	10	47	89	2	○
1180903Z9	HBDPUE 2 03D 0840-089047	8,4	10	47	89	2	○
1180904Z9	HBDPUE 2 03D 0850-089047	8,5	10	47	89	2	○
1180905Z9	HBDPUE 2 03D 0860-089047	8,6	10	47	89	2	○
1180906Z9	HBDPUE 2 03D 0870-089047	8,7	10	47	89	2	○
1180907Z9	HBDPUE 2 03D 0880-089047	8,8	10	47	89	2	○
1180908Z9	HBDPUE 2 03D 0890-089047	8,9	10	47	89	2	○
1180909Z9	HBDPUE 2 03D 0900-089047	9	10	47	89	2	○
1180910Z9	HBDPUE 2 03D 0910-089047	9,1	10	47	89	2	○
1180911Z9	HBDPUE 2 03D 0920-089047	9,2	10	47	89	2	○
1180912Z9	HBDPUE 2 03D 0930-089047	9,3	10	47	89	2	○
1180913Z9	HBDPUE 2 03D 0940-089047	9,4	10	47	89	2	○
1180914Z9	HBDPUE 2 03D 0950-089047	9,5	10	47	89	2	○
1180915Z9	HBDPUE 2 03D 0960-089047	9,6	10	47	89	2	○
1180916Z9	HBDPUE 2 03D 0970-089047	9,7	10	47	89	2	○
1180917Z9	HBDPUE 2 03D 0980-089047	9,8	10	47	89	2	○
1180918Z9	HBDPUE 2 03D 0990-089047	9,9	10	47	89	2	○
1180919Z9	HBDPUE 2 03D 1000-089047	10	10	47	89	2	○
1180920Z9	HBDPUE 2 03D 1010-102055	10,1	12	55	102	2	○
1180921Z9	HBDPUE 2 03D 1020-102055	10,2	12	55	102	2	○
1180922Z9	HBDPUE 2 03D 1030-102055	10,3	12	55	102	2	○
1180923Z9	HBDPUE 2 03D 1040-102055	10,4	12	55	102	2	○
1180924Z9	HBDPUE 2 03D 1050-102055	10,5	12	55	102	2	○
1180925Z9	HBDPUE 2 03D 1060-102055	10,6	12	55	102	2	○
1180926Z9	HBDPUE 2 03D 1070-102055	10,7	12	55	102	2	○
1180927Z9	HBDPUE 2 03D 1080-102055	10,8	12	55	102	2	○
1180928Z9	HBDPUE 2 03D 1090-102055	10,9	12	55	102	2	○
1180929Z9	HBDPUE 2 03D 1100-102055	11	12	55	102	2	○
1180930Z9	HBDPUE 2 03D 1110-102055	11,1	12	55	102	2	○
1180931Z9	HBDPUE 2 03D 1120-102055	11,2	12	55	102	2	○
1180932Z9	HBDPUE 2 03D 1130-102055	11,3	12	55	102	2	○
1180933Z9	HBDPUE 2 03D 1140-102055	11,4	12	55	102	2	○
1180934Z9	HBDPUE 2 03D 1150-102055	11,5	12	55	102	2	○
1180935Z9	HBDPUE 2 03D 1160-102055	11,6	12	55	102	2	○
1180936Z9	HBDPUE 2 03D 1170-102055	11,7	12	55	102	2	○
1180937Z9	HBDPUE 2 03D 1180-102055	11,8	12	55	102	2	○

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180938Z9	HBDPUE 2 03D 1190-102055	11,9	12	55	102	2	○
1180939Z9	HBDPUE 2 03D 1200-102055	12	12	55	102	2	○
1180940Z9	HBDPUE 2 03D 1250-107060	12,5	14	60	107	2	○
1180941Z9	HBDPUE 2 03D 1300-107060	13	14	60	107	2	○
1180942Z9	HBDPUE 2 03D 1350-107060	13,5	14	60	107	2	○
1180943Z9	HBDPUE 2 03D 1400-107060	14	14	60	107	2	○
1180944Z9	HBDPUE 2 03D 1450-115065	14,5	16	65	115	2	○
1180945Z9	HBDPUE 2 03D 1500-115065	15	16	65	115	2	○
1180946Z9	HBDPUE 2 03D 1550-115065	15,5	16	65	115	2	○
1180947Z9	HBDPUE 2 03D 1600-115065	16	16	65	115	2	○
1180948Z9	HBDPUE 2 03D 1650-123073	16,5	18	73	123	2	○
1180949Z9	HBDPUE 2 03D 1700-123073	17	18	73	123	2	○
1180950Z9	HBDPUE 2 03D 1750-123073	17,5	18	73	123	2	○
1180951Z9	HBDPUE 2 03D 1800-123073	18	18	73	123	2	○
1180952Z9	HBDPUE 2 03D 1850-131079	18,5	20	79	131	2	○
1180953Z9	HBDPUE 2 03D 1900-131079	19	20	79	131	2	○
1180954Z9	HBDPUE 2 03D 1950-131079	19,5	20	79	131	2	○
1180955Z9	HBDPUE 2 03D 2000-131079	20	20	79	131	2	○

Stock item | Produto de stock  
Itens de stock

Available under request | Disponível sobre consulta  
Disponível bajo consulta



DRILLING

DRILLING

Inserts

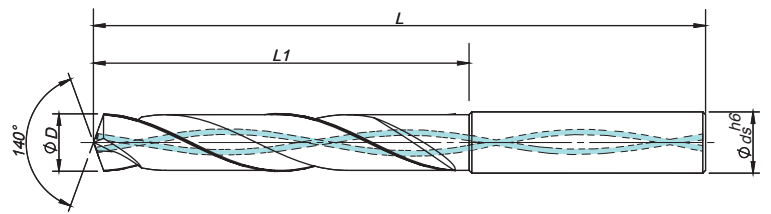
Jet Drill

Vortex Drill

Solid Carbide Drills

Spare Parts

Technical Data



P	K
HRC ≤ 60	IT8-9 IT class

Drill Dia. ØD	ØD3,0	3,0<ØD≤6,0	6,0<ØD≤10,0	10,0<ØD≤18,0	18,0<ØD≤20,0
Hole Tolerances	+0,002	+0,004	+0,006	+0,007	+0,008
	+0,012	+0,016	+0,021	+0,025	+0,028

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180788Z9	HBDPCE 2 05D 0300-066028	3	6	28	66	2	⊗
1181160Z9	HBDPCE 2 05D 0310-066028	3,1	6	28	66	2	⊗
1181161Z9	HBDPCE 2 05D 0320-066028	3,2	6	28	66	2	⊗
1181162Z9	HBDPCE 2 05D 0330-066028	3,3	6	28	66	2	⊗
1180797Z9	HBDPCE 2 05D 0340-066028	3,4	6	28	66	2	⊗
1181163Z9	HBDPCE 2 05D 0350-066028	3,5	6	28	66	2	⊗
1181164Z9	HBDPCE 2 05D 0360-066028	3,6	6	28	66	2	○
1180798Z9	HBDPCE 2 05D 0370-066028	3,7	6	28	66	2	⊗
1181165Z9	HBDPCE 2 05D 0380-074036	3,8	6	36	74	2	○
1181166Z9	HBDPCE 2 05D 0390-074036	3,9	6	36	74	2	○
1181167Z9	HBDPCE 2 05D 0400-074036	4	6	36	74	2	⊗
1181168Z9	HBDPCE 2 05D 0410-074036	4,1	6	36	74	2	⊗
1180799Z9	HBDPCE 2 05D 0420-074036	4,2	6	36	74	2	⊗
1180800Z9	HBDPCE 2 05D 0430-074036	4,3	6	36	74	2	⊗
1181169Z9	HBDPCE 2 05D 0440-074036	4,4	6	36	74	2	○
1181170Z9	HBDPCE 2 05D 0450-074036	4,5	6	36	74	2	○
1181171Z9	HBDPCE 2 05D 0460-074036	4,6	6	36	74	2	○
1181172Z9	HBDPCE 2 05D 0470-074036	4,7	6	36	74	2	⊗
1181173Z9	HBDPCE 2 05D 0480-082044	4,8	6	44	82	2	○
1181174Z9	HBDPCE 2 05D 0490-082044	4,9	6	44	82	2	○
1180801Z9	HBDPCE 2 05D 0500-082044	5	6	44	82	2	⊗
1181175Z9	HBDPCE 2 05D 0510-082044	5,1	6	44	82	2	○
1181176Z9	HBDPCE 2 05D 0520-082044	5,2	6	44	82	2	○
1181177Z9	HBDPCE 2 05D 0530-082044	5,3	6	44	82	2	○
1181178Z9	HBDPCE 2 05D 0540-082044	5,4	6	44	82	2	○

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181179Z9	HBDPCE 2 05D 0550-082044	5,5	6	44	82	2	○
1181180Z9	HBDPCE 2 05D 0560-082044	5,6	6	44	82	2	○
1181181Z9	HBDPCE 2 05D 0570-082044	5,7	6	44	82	2	○
1180802Z9	HBDPCE 2 05D 0580-082044	5,8	6	44	82	2	⊗
1181182Z9	HBDPCE 2 05D 0590-082044	5,9	6	44	82	2	○
1181183Z9	HBDPCE 2 05D 0600-082044	6	6	44	82	2	⊗
1181184Z9	HBDPCE 2 05D 0610-091053	6,1	8	53	91	2	○
1181185Z9	HBDPCE 2 05D 0620-091053	6,2	8	53	91	2	○
1181186Z9	HBDPCE 2 05D 0630-091053	6,3	8	53	91	2	○
1181187Z9	HBDPCE 2 05D 0640-091053	6,4	8	53	91	2	○
1180787Z9	HBDPCE 2 05D 0650-091053	6,5	8	53	91	2	⊗
1181188Z9	HBDPCE 2 05D 0660-091053	6,6	8	53	91	2	⊗
1181189Z9	HBDPCE 2 05D 0670-091053	6,7	8	53	91	2	○
1180803Z9	HBDPCE 2 05D 0680-091053	6,8	8	53	91	2	⊗
1181190Z9	HBDPCE 2 05D 0690-091053	6,9	8	53	91	2	○
1180804Z9	HBDPCE 2 05D 0700-091053	7	8	53	91	2	⊗
1181191Z9	HBDPCE 2 05D 0710-091053	7,1	8	53	91	2	○
1181192Z9	HBDPCE 2 05D 0720-091053	7,2	8	53	91	2	○
1181193Z9	HBDPCE 2 05D 0730-091053	7,3	8	53	91	2	○
1180805Z9	HBDPCE 2 05D 0740-091053	7,4	8	53	91	2	⊗
1181194Z9	HBDPCE 2 05D 0750-091053	7,5	8	53	91	2	○
1181195Z9	HBDPCE 2 05D 0760-091053	7,6	8	53	91	2	○
1181196Z9	HBDPCE 2 05D 0770-091053	7,7	8	53	91	2	○
1181197Z9	HBDPCE 2 05D 0780-091053	7,8	8	53	91	2	○
1181198Z9	HBDPCE 2 05D 0790-091053	7,9	8	53	91	2	○

⊗ Stock item | Produto de stock | Disponível sobre consulta  
 ○ Available under request | Disponível sobre consulta  
 Itens de stock | Disponible bajo consulta



Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181199Z9	HBDPCE 2 05D 0800-091053	8	8	53	91	2	
1181200Z9	HBDPCE 2 05D 0810-103061	8,1	10	61	103	2	
1181201Z9	HBDPCE 2 05D 0820-103061	8,2	10	61	103	2	
1181202Z9	HBDPCE 2 05D 0830-103061	8,3	10	61	103	2	
1181203Z9	HBDPCE 2 05D 0840-103061	8,4	10	61	103	2	
1180806Z9	HBDPCE 2 05D 0850-103061	8,5	10	61	103	2	
1181204Z9	HBDPCE 2 05D 0860-103061	8,6	10	61	103	2	
1181205Z9	HBDPCE 2 05D 0870-103061	8,7	10	61	103	2	
1181206Z9	HBDPCE 2 05D 0880-103061	8,8	10	61	103	2	
1181207Z9	HBDPCE 2 05D 0890-103061	8,9	10	61	103	2	
1180807Z9	HBDPCE 2 05D 0900-103061	9	10	61	103	2	
1181208Z9	HBDPCE 2 05D 0910-103061	9,1	10	61	103	2	
1181209Z9	HBDPCE 2 05D 0920-103061	9,2	10	61	103	2	
1181210Z9	HBDPCE 2 05D 0930-103061	9,3	10	61	103	2	
1181211Z9	HBDPCE 2 05D 0940-103061	9,4	10	61	103	2	
1181212Z9	HBDPCE 2 05D 0950-103061	9,5	10	61	103	2	
1181213Z9	HBDPCE 2 05D 0960-103061	9,6	10	61	103	2	
1181214Z9	HBDPCE 2 05D 0970-103061	9,7	10	61	103	2	
1181215Z9	HBDPCE 2 05D 0980-103061	9,8	10	61	103	2	
1181216Z9	HBDPCE 2 05D 0990-103061	9,9	10	61	103	2	
1181217Z9	HBDPCE 2 05D 1000-103061	10	10	61	103	2	
1181218Z9	HBDPCE 2 05D 1010-118071	10,1	12	71	118	2	
1180808Z9	HBDPCE 2 05D 1020-118071	10,2	12	71	118	2	
1181219Z9	HBDPCE 2 05D 1030-118071	10,3	12	71	118	2	
1181220Z9	HBDPCE 2 05D 1040-118071	10,4	12	71	118	2	
1180809Z9	HBDPCE 2 05D 1050-118071	10,5	12	71	118	2	
1180810Z9	HBDPCE 2 05D 1060-118071	10,6	12	71	118	2	
1181221Z9	HBDPCE 2 05D 1070-118071	10,7	12	71	118	2	
1181222Z9	HBDPCE 2 05D 1080-118071	10,8	12	71	118	2	
1181223Z9	HBDPCE 2 05D 1090-118071	10,9	12	71	118	2	
1180811Z9	HBDPCE 2 05D 1100-118071	11	12	71	118	2	
1181224Z9	HBDPCE 2 05D 1110-118071	11,1	12	71	118	2	
1181225Z9	HBDPCE 2 05D 1120-118071	11,2	12	71	118	2	
1181226Z9	HBDPCE 2 05D 1130-118071	11,3	12	71	118	2	
1181227Z9	HBDPCE 2 05D 1140-118071	11,4	12	71	118	2	
1180812Z9	HBDPCE 2 05D 1150-118071	11,5	12	71	118	2	
1181228Z9	HBDPCE 2 05D 1160-118071	11,6	12	71	118	2	
1181229Z9	HBDPCE 2 05D 1170-118071	11,7	12	71	118	2	
1181230Z9	HBDPCE 2 05D 1180-118071	11,8	12	71	118	2	
1181231Z9	HBDPCE 2 05D 1190-118071	11,9	12	71	118	2	
1180813Z9	HBDPCE 2 05D 1200-118071	12	12	71	118	2	
1181232Z9	HBDPCE 2 05D 1250-124077	12,5	14	77	124	2	
1180814Z9	HBDPCE 2 05D 1300-124077	13	14	77	124	2	
1181233Z9	HBDPCE 2 05D 1350-124077	13,5	14	77	124	2	
1181234Z9	HBDPCE 2 05D 1400-124077	14	14	77	124	2	

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181235Z9	HBDPCE 2 05D 1450-133083	14,5	16	83	133	2	
1181236Z9	HBDPCE 2 05D 1500-133083	15	16	83	133	2	
1181237Z9	HBDPCE 2 05D 1550-133083	15,5	16	83	133	2	
1181238Z9	HBDPCE 2 05D 1600-133083	16	16	83	133	2	
1181239Z9	HBDPCE 2 05D 1650-143093	16,5	18	93	143	2	
1181240Z9	HBDPCE 2 05D 1700-143093	17	18	93	143	2	
1180816Z9	HBDPCE 2 05D 1750-143093	17,5	18	93	143	2	
1181241Z9	HBDPCE 2 05D 1800-143093	18	18	93	143	2	
1181242Z9	HBDPCE 2 05D 1850-153101	18,5	20	101	153	2	
1181243Z9	HBDPCE 2 05D 1900-153101	19	20	101	153	2	
1181244Z9	HBDPCE 2 05D 1950-153101	19,5	20	101	153	2	
1181245Z9	HBDPCE 2 05D 2000-153101	20	20	101	153	2	

Stock item | Produto de stock  
Itens de stock

Available under request | Disponível sobre consulta  
Disponível bajo consulta

DRILLING

DRILLING

Inserts

Jet Drill

Vortex Drill

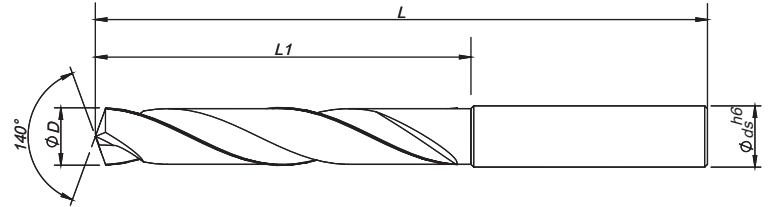
Solid Carbide Drills

Spare Parts

Technical Data



P	K
HRC ≤ 60	IT8-9 IT class



Drill Dia. ØD	ØD3,0	3,0<ØD≤6,0	6,0<ØD≤10,0	10,0<ØD≤18,0	18,0<ØD≤20,0
Hole Tolerances	+0,002	+0,004	+0,006	+0,007	+0,008
	+0,012	+0,016	+0,021	+0,025	+0,028

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1180793Z9	HBDPUE 2 05D 0300-066028	3	6	28	66	2	○
1180794Z9	HBDPUE 2 05D 0310-066028	3,1	6	28	66	2	○
1181062Z9	HBDPUE 2 05D 0320-066028	3,2	6	28	66	2	○
1181063Z9	HBDPUE 2 05D 0330-066028	3,3	6	28	66	2	○
1180789Z9	HBDPUE 2 05D 0340-066028	3,4	6	28	66	2	○
1181064Z9	HBDPUE 2 05D 0350-066028	3,5	6	28	66	2	○
1181065Z9	HBDPUE 2 05D 0360-066028	3,6	6	28	66	2	○
1181066Z9	HBDPUE 2 05D 0370-066028	3,7	6	28	66	2	○
1181067Z9	HBDPUE 2 05D 0380-074036	3,8	6	36	74	2	○
1180795Z9	HBDPUE 2 05D 0390-074036	3,9	6	36	74	2	○
1181068Z9	HBDPUE 2 05D 0400-074036	4	6	36	74	2	○
1181069Z9	HBDPUE 2 05D 0410-074036	4,1	6	36	74	2	○
1180785Z9	HBDPUE 2 05D 0420-074036	4,2	6	36	74	2	○
1181070Z9	HBDPUE 2 05D 0430-074036	4,3	6	36	74	2	○
1181071Z9	HBDPUE 2 05D 0440-074036	4,4	6	36	74	2	○
1181072Z9	HBDPUE 2 05D 0450-074036	4,5	6	36	74	2	○
1181073Z9	HBDPUE 2 05D 0460-074036	4,6	6	36	74	2	○
1180786Z9	HBDPUE 2 05D 0470-074036	4,7	6	36	74	2	○
1181074Z9	HBDPUE 2 05D 0480-082044	4,8	6	44	82	2	○
1181075Z9	HBDPUE 2 05D 0490-082044	4,9	6	44	82	2	○
1180782Z9	HBDPUE 2 05D 0500-082044	5	6	44	82	2	○
1181076Z9	HBDPUE 2 05D 0510-082044	5,1	6	44	82	2	○
1181077Z9	HBDPUE 2 05D 0520-082044	5,2	6	44	82	2	○
1181078Z9	HBDPUE 2 05D 0530-082044	5,3	6	44	82	2	○
1181079Z9	HBDPUE 2 05D 0540-082044	5,4	6	44	82	2	○

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181080Z9	HBDPUE 2 05D 0550-082044	5,5	6	44	82	2	○
1181081Z9	HBDPUE 2 05D 0560-082044	5,6	6	44	82	2	○
1181082Z9	HBDPUE 2 05D 0570-082044	5,7	6	44	82	2	○
1181083Z9	HBDPUE 2 05D 0580-082044	5,8	6	44	82	2	○
1181084Z9	HBDPUE 2 05D 0590-082044	5,9	6	44	82	2	○
1181085Z9	HBDPUE 2 05D 0600-082044	6	6	44	82	2	○
1181086Z9	HBDPUE 2 05D 0610-091053	6,1	8	53	91	2	○
1181087Z9	HBDPUE 2 05D 0620-091053	6,2	8	53	91	2	○
1181088Z9	HBDPUE 2 05D 0630-091053	6,3	8	53	91	2	○
1181089Z9	HBDPUE 2 05D 0640-091053	6,4	8	53	91	2	○
1181090Z9	HBDPUE 2 05D 0650-091053	6,5	8	53	91	2	○
1181091Z9	HBDPUE 2 05D 0660-091053	6,6	8	53	91	2	○
1181092Z9	HBDPUE 2 05D 0670-091053	6,7	8	53	91	2	○
1180781Z9	HBDPUE 2 05D 0680-091053	6,8	8	53	91	2	○
1181093Z9	HBDPUE 2 05D 0690-091053	6,9	8	53	91	2	○
1181094Z9	HBDPUE 2 05D 0700-091053	7	8	53	91	2	○
1181095Z9	HBDPUE 2 05D 0710-091053	7,1	8	53	91	2	○
1181096Z9	HBDPUE 2 05D 0720-091053	7,2	8	53	91	2	○
1181097Z9	HBDPUE 2 05D 0730-091053	7,3	8	53	91	2	○
1181098Z9	HBDPUE 2 05D 0740-091053	7,4	8	53	91	2	○
1181099Z9	HBDPUE 2 05D 0750-091053	7,5	8	53	91	2	○
1181100Z9	HBDPUE 2 05D 0760-091053	7,6	8	53	91	2	○
1181101Z9	HBDPUE 2 05D 0770-091053	7,7	8	53	91	2	○
1181102Z9	HBDPUE 2 05D 0780-091053	7,8	8	53	91	2	○
1181103Z9	HBDPUE 2 05D 0790-091053	7,9	8	53	91	2	○

Stock item | Produto de stock  
Itens de stock

Available under request | Disponível sobre consulta  
Disponível bajo consulta

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181104Z9	HBDPUE 2 05D 0800-091053	8	8	53	91	2	○
1181105Z9	HBDPUE 2 05D 0810-103061	8,1	10	61	103	2	○
1181106Z9	HBDPUE 2 05D 0820-103061	8,2	10	61	103	2	○
1181107Z9	HBDPUE 2 05D 0830-103061	8,3	10	61	103	2	○
1181108Z9	HBDPUE 2 05D 0840-103061	8,4	10	61	103	2	○
1181109Z9	HBDPUE 2 05D 0850-103061	8,5	10	61	103	2	○
1181110Z9	HBDPUE 2 05D 0860-103061	8,6	10	61	103	2	○
1181111Z9	HBDPUE 2 05D 0870-103061	8,7	10	61	103	2	○
1181112Z9	HBDPUE 2 05D 0880-103061	8,8	10	61	103	2	○
1181113Z9	HBDPUE 2 05D 0890-103061	8,9	10	61	103	2	○
1181114Z9	HBDPUE 2 05D 0900-103061	9	10	61	103	2	○
1181115Z9	HBDPUE 2 05D 0910-103061	9,1	10	61	103	2	○
1181116Z9	HBDPUE 2 05D 0920-103061	9,2	10	61	103	2	○
1181117Z9	HBDPUE 2 05D 0930-103061	9,3	10	61	103	2	○
1181118Z9	HBDPUE 2 05D 0940-103061	9,4	10	61	103	2	○
1181119Z9	HBDPUE 2 05D 0950-103061	9,5	10	61	103	2	○
1181120Z9	HBDPUE 2 05D 0960-103061	9,6	10	61	103	2	○
1181121Z9	HBDPUE 2 05D 0970-103061	9,7	10	61	103	2	○
1181122Z9	HBDPUE 2 05D 0980-103061	9,8	10	61	103	2	○
1181123Z9	HBDPUE 2 05D 0990-103061	9,9	10	61	103	2	○
1181124Z9	HBDPUE 2 05D 1000-103061	10	10	61	103	2	○
1181125Z9	HBDPUE 2 05D 1010-118071	10,1	12	71	118	2	○
1181126Z9	HBDPUE 2 05D 1020-118071	10,2	12	71	118	2	○
1181127Z9	HBDPUE 2 05D 1030-118071	10,3	12	71	118	2	○
1181128Z9	HBDPUE 2 05D 1040-118071	10,4	12	71	118	2	○
1180796Z9	HBDPUE 2 05D 1050-118071	10,5	12	71	118	2	○
1181129Z9	HBDPUE 2 05D 1060-118071	10,6	12	71	118	2	○
1181130Z9	HBDPUE 2 05D 1070-118071	10,7	12	71	118	2	○
1181131Z9	HBDPUE 2 05D 1080-118071	10,8	12	71	118	2	○
1181132Z9	HBDPUE 2 05D 1090-118071	10,9	12	71	118	2	○
1181133Z9	HBDPUE 2 05D 1100-118071	11	12	71	118	2	○
1181134Z9	HBDPUE 2 05D 1110-118071	11,1	12	71	118	2	○
1181135Z9	HBDPUE 2 05D 1120-118071	11,2	12	71	118	2	○
1181136Z9	HBDPUE 2 05D 1130-118071	11,3	12	71	118	2	○
1181137Z9	HBDPUE 2 05D 1140-118071	11,4	12	71	118	2	○
1181138Z9	HBDPUE 2 05D 1150-118071	11,5	12	71	118	2	○
1181139Z9	HBDPUE 2 05D 1160-118071	11,6	12	71	118	2	○
1181140Z9	HBDPUE 2 05D 1170-118071	11,7	12	71	118	2	○
1181141Z9	HBDPUE 2 05D 1180-118071	11,8	12	71	118	2	○
1181142Z9	HBDPUE 2 05D 1190-118071	11,9	12	71	118	2	○
1181143Z9	HBDPUE 2 05D 1200-118071	12	12	71	118	2	○
1181144Z9	HBDPUE 2 05D 1250-124077	12,5	14	77	124	2	○
1181145Z9	HBDPUE 2 05D 1300-124077	13	14	77	124	2	○
1181146Z9	HBDPUE 2 05D 1350-124077	13,5	14	77	124	2	○
1181147Z9	HBDPUE 2 05D 1400-124077	14	14	77	124	2	○

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181148Z9	HBDPUE 2 05D 1450-133083	14,5	16	83	133	2	○
1181149Z9	HBDPUE 2 05D 1500-133083	15	16	83	133	2	○
1181150Z9	HBDPUE 2 05D 1550-133083	15,5	16	83	133	2	○
1181151Z9	HBDPUE 2 05D 1600-133083	16	16	83	133	2	○
1181152Z9	HBDPUE 2 05D 1650-143093	16,5	18	93	143	2	○
1181153Z9	HBDPUE 2 05D 1700-143093	17	18	93	143	2	○
1181154Z9	HBDPUE 2 05D 1750-143093	17,5	18	93	143	2	○
1181155Z9	HBDPUE 2 05D 1800-143093	18	18	93	143	2	○
1181156Z9	HBDPUE 2 05D 1850-153101	18,5	20	101	153	2	○
1181157Z9	HBDPUE 2 05D 1900-153101	19	20	101	153	2	○
1181158Z9	HBDPUE 2 05D 1950-153101	19,5	20	101	153	2	○
1181159Z9	HBDPUE 2 05D 2000-153101	20	20	101	153	2	○

Stock item | Produto de stock  
Itens de stock

Available under request | Disponível sobre consulta  
Disponível bajo consulta

DRILLING

DRILLING

Inserts

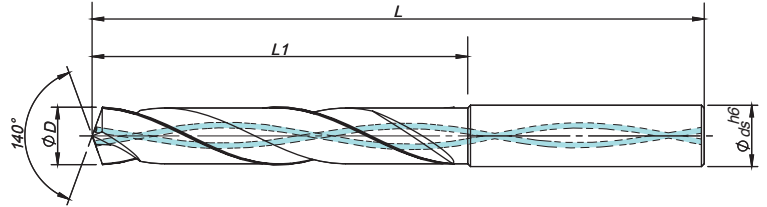
Jet Drill

Vortex Drill

Solid Carbide Drills

Spare Parts

Technical Data



P	K
HRC ≤ 48	IT8-9 IT class

Drill Dia. ØD	3,0<ØD≤5,0	5,0<ØD≤6,0	6,0<ØD≤10,0	10,0<ØD≤12,0
Hole Tolerances	+0,002	+0,004	+0,006	+0,007
	+0,012	+0,016	+0,021	+0,025

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181246Z9	HBDPCE 2 08D 0300-072034	3	6	34	72	2	○
1181247Z9	HBDPCE 2 08D 0310-072034	3,1	6	34	72	2	○
1181248Z9	HBDPCE 2 08D 0320-072034	3,2	6	34	72	2	○
1181249Z9	HBDPCE 2 08D 0330-072034	3,3	6	34	72	2	○
1181250Z9	HBDPCE 2 08D 0340-072034	3,4	6	34	72	2	○
1181251Z9	HBDPCE 2 08D 0350-072034	3,5	6	34	72	2	○
1181252Z9	HBDPCE 2 08D 0360-072034	3,6	6	34	72	2	○
1181253Z9	HBDPCE 2 08D 0370-072034	3,7	6	34	72	2	○
1181254Z9	HBDPCE 2 08D 0380-081043	3,8	6	43	81	2	○
1181255Z9	HBDPCE 2 08D 0390-081043	3,9	6	43	81	2	○
1181256Z9	HBDPCE 2 08D 0400-081043	4	6	43	81	2	○
1181257Z9	HBDPCE 2 08D 0410-081043	4,1	6	43	81	2	○
1181258Z9	HBDPCE 2 08D 0420-081043	4,2	6	43	81	2	○
1181259Z9	HBDPCE 2 08D 0430-081043	4,3	6	43	81	2	○
1181260Z9	HBDPCE 2 08D 0440-081043	4,4	6	43	81	2	○
1181261Z9	HBDPCE 2 08D 0450-081043	4,5	6	43	81	2	○
1181262Z9	HBDPCE 2 08D 0460-081043	4,6	6	43	81	2	○
1181263Z9	HBDPCE 2 08D 0470-081043	4,7	6	43	81	2	○
1181264Z9	HBDPCE 2 08D 0480-095057	4,8	6	57	95	2	○
1181265Z9	HBDPCE 2 08D 0490-095057	4,9	6	57	95	2	○
1181266Z9	HBDPCE 2 08D 0500-095057	5	6	57	95	2	○
1181267Z9	HBDPCE 2 08D 0510-095057	5,1	6	57	95	2	○
1181268Z9	HBDPCE 2 08D 0520-095057	5,2	6	57	95	2	○
1181269Z9	HBDPCE 2 08D 0530-095057	5,3	6	57	95	2	○
1181270Z9	HBDPCE 2 08D 0540-095057	5,4	6	57	95	2	○

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181271Z9	HBDPCE 2 08D 0550-095057	5,5	6	57	95	2	○
1181272Z9	HBDPCE 2 08D 0560-095057	5,6	6	57	95	2	○
1181273Z9	HBDPCE 2 08D 0570-095057	5,7	6	57	95	2	○
1181274Z9	HBDPCE 2 08D 0580-095057	5,8	6	57	95	2	○
1181275Z9	HBDPCE 2 08D 0590-095057	5,9	6	57	95	2	○
1181276Z9	HBDPCE 2 08D 0600-095057	6	6	57	95	2	○
1181277Z9	HBDPCE 2 08D 0610-114076	6,1	8	76	114	2	○
1181278Z9	HBDPCE 2 08D 0620-114076	6,2	8	76	114	2	○
1181279Z9	HBDPCE 2 08D 0630-114076	6,3	8	76	114	2	○
1181280Z9	HBDPCE 2 08D 0640-114076	6,4	8	76	114	2	○
1181281Z9	HBDPCE 2 08D 0650-114076	6,5	8	76	114	2	○
1181282Z9	HBDPCE 2 08D 0660-114076	6,6	8	76	114	2	○
1181283Z9	HBDPCE 2 08D 0670-114076	6,7	8	76	114	2	○
1181284Z9	HBDPCE 2 08D 0680-114076	6,8	8	76	114	2	○
1181285Z9	HBDPCE 2 08D 0690-114076	6,9	8	76	114	2	○
1181286Z9	HBDPCE 2 08D 0700-114076	7	8	76	114	2	○
1181287Z9	HBDPCE 2 08D 0710-114076	7,1	8	76	114	2	○
1181288Z9	HBDPCE 2 08D 0720-114076	7,2	8	76	114	2	○
1181289Z9	HBDPCE 2 08D 0730-114076	7,3	8	76	114	2	○
1181290Z9	HBDPCE 2 08D 0740-114076	7,4	8	76	114	2	○
1181291Z9	HBDPCE 2 08D 0750-114076	7,5	8	76	114	2	○
1181292Z9	HBDPCE 2 08D 0760-114076	7,6	8	76	114	2	○
1181293Z9	HBDPCE 2 08D 0770-114076	7,7	8	76	114	2	○
1181294Z9	HBDPCE 2 08D 0780-114076	7,8	8	76	114	2	○
1181295Z9	HBDPCE 2 08D 0790-114076	7,9	8	76	114	2	○

Stock item | Produto de stock  
Itens de stock

Available under request | Disponível sobre consulta  
Disponível bajo consulta

Order code Código	Reference Referência Referencia	Dimensions   Dimensões Dimensiones (mm)				Z	PHU920
		ØD	Ø ds	L1	L		
1181296Z9	HBDPCE 2 08D 0800-114076	8	8	76	114	2	○
1181297Z9	HBDPCE 2 08D 0810-142095	8,1	10	95	142	2	○
1181298Z9	HBDPCE 2 08D 0820-142095	8,2	10	95	142	2	○
1181299Z9	HBDPCE 2 08D 0830-142095	8,3	10	95	142	2	○
1181300Z9	HBDPCE 2 08D 0840-142095	8,4	10	95	142	2	○
1181301Z9	HBDPCE 2 08D 0850-142095	8,5	10	95	142	2	○
1181302Z9	HBDPCE 2 08D 0860-142095	8,6	10	95	142	2	○
1181303Z9	HBDPCE 2 08D 0870-142095	8,7	10	95	142	2	○
1181304Z9	HBDPCE 2 08D 0880-142095	8,8	10	95	142	2	○
1181305Z9	HBDPCE 2 08D 0890-142095	8,9	10	95	142	2	○
1181306Z9	HBDPCE 2 08D 0900-142095	9	10	95	142	2	○
1181307Z9	HBDPCE 2 08D 0910-142095	9,1	10	95	142	2	○
1181308Z9	HBDPCE 2 08D 0920-142095	9,2	10	95	142	2	○
1181309Z9	HBDPCE 2 08D 0930-142095	9,3	10	95	142	2	○
1181310Z9	HBDPCE 2 08D 0940-142095	9,4	10	95	142	2	○
1181311Z9	HBDPCE 2 08D 0950-142095	9,5	10	95	142	2	○
1181312Z9	HBDPCE 2 08D 0960-142095	9,6	10	95	142	2	○
1181313Z9	HBDPCE 2 08D 0970-142095	9,7	10	95	142	2	○
1181314Z9	HBDPCE 2 08D 0980-142095	9,8	10	95	142	2	○
1181315Z9	HBDPCE 2 08D 0990-142095	9,9	10	95	142	2	○
1181316Z9	HBDPCE 2 08D 1000-142095	10	10	95	142	2	○
1181317Z9	HBDPCE 2 08D 1010-162114	10,1	12	114	162	2	○
1181318Z9	HBDPCE 2 08D 1020-162114	10,2	12	114	162	2	○
1181319Z9	HBDPCE 2 08D 1030-162114	10,3	12	114	162	2	○
1181320Z9	HBDPCE 2 08D 1040-162114	10,4	12	114	162	2	○
1181321Z9	HBDPCE 2 08D 1050-162114	10,5	12	114	162	2	○
1181322Z9	HBDPCE 2 08D 1060-162114	10,6	12	114	162	2	○
1181323Z9	HBDPCE 2 08D 1070-162114	10,7	12	114	162	2	○
1181324Z9	HBDPCE 2 08D 1080-162114	10,8	12	114	162	2	○
1181325Z9	HBDPCE 2 08D 1090-162114	10,9	12	114	162	2	○
1181326Z9	HBDPCE 2 08D 1100-162114	11	12	114	162	2	○
1181327Z9	HBDPCE 2 08D 1110-162114	11,1	12	114	162	2	○
1181328Z9	HBDPCE 2 08D 1120-162114	11,2	12	114	162	2	○
1181329Z9	HBDPCE 2 08D 1130-162114	11,3	12	114	162	2	○
1181330Z9	HBDPCE 2 08D 1140-162114	11,4	12	114	162	2	○
1181331Z9	HBDPCE 2 08D 1150-162114	11,5	12	114	162	2	○
1181332Z9	HBDPCE 2 08D 1160-162114	11,6	12	114	162	2	○
1181333Z9	HBDPCE 2 08D 1170-162114	11,7	12	114	162	2	○
1181334Z9	HBDPCE 2 08D 1180-162114	11,8	12	114	162	2	○
1181335Z9	HBDPCE 2 08D 1190-162114	11,9	12	114	162	2	○
1181336Z9	HBDPCE 2 08D 1200-162114	12	12	114	162	2	○

 Stock item | Produto de stock  
Itens de stock

Available under request | Disponível sobre consulta  
Disponível bajo consulta

SCREWS & KEYS

DRILLING

DRILLING

Inserts



Jet Drill

Order Code	Reference Referência Referencia
290031400	P0200500
290030600	P0220500
290031300	P0250704
290030900	P0350903
290047500	P0401200
290031700	P0501300
290025800	P0180500
290033100	P0250503
290030800	P0300701
290031000	P0401101

Vortex Drill

Order Code	Reference Referência Referencia
290075700	P012013
290075800	P014015
290075900	P016017
290076000	P018019
290076100	P020021
290076200	P022023
290076300	P024025
290076400	P026027
290076500	P028029
290076600	P030031

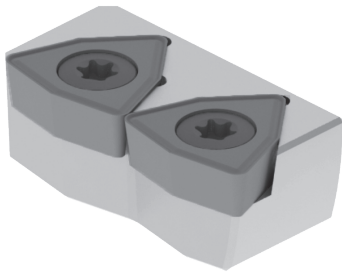
Solid Carbide Drills

Order Code	Reference Referência Referencia
290011400	XT06
290012900	XT07
290011700	XT08
290025700	XT09
290012400	XT15
290013200	XT20
290074700	TT15
290056000	TT20
290056100	TT25

Spare Parts

Technical Data

## MDO CARTRIDGE



Order separately

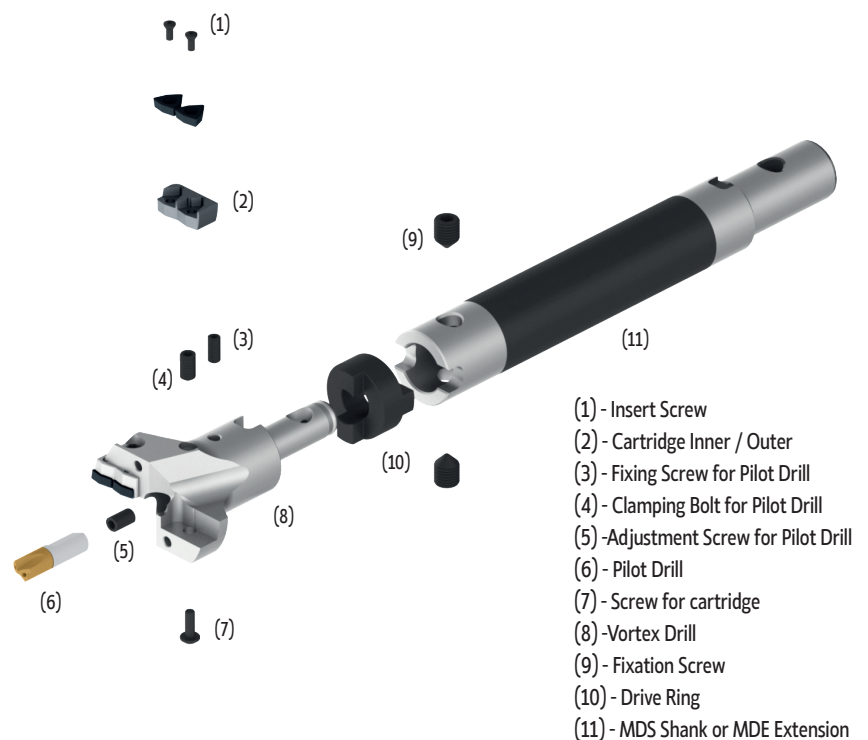
ØD (mm)	Inner Cartridge		Outer Cartridge		Insert	Insert Screw	Torx key	For Drill
	Order Code	Reference	Order Code	Reference				
<b>2 INSERTS PER CARTRIDGE</b>								
45-50	184062000	MDC 045050-I	184252600	MDC 045050-O	WC... 030204	P0220500	XT07	MDO 04505013
50-55	184250400	MDC 050055-I	184252700	MDC 050055-O	WC... 030204	P0220500	XT07	MDO 05005513
55-60	184250500	MDC 055060-I	184252800	MDC 055060-O	WC... 040204	P0250503	XT08	MDO 05506016
60-65	184250600	MDC 060065-I	184252900	MDC 060065-O	WC... 050308	P0300701	XT08	MDO 06006516
65-70	184250700	MDC 065070-I	184253000	MDC 065070-O	WC... 050308	P0300701	XT08	MDO 06507016
70-75	184250800	MDC 070075-I	184063700	MDC 070075-O	WC... 050308	P0300701	XT08	MDO 07007522
75-80	184250900	MDC 075080-I	184063800	MDC 075080-O	WC... 06T308	P0350903	XT15	MDO 07508022
80-85	184251000	MDC 080085-I	184063900	MDC 080085-O	WC... 06T308	P0350903	XT15	MDO 08008522
85-90	184251100	MDC 085090-I	184064000	MDC 085090-O	WC... 06T308	P0350903	XT15	MDO 08509027
90-95	184251200	MDC 090095-I	184064100	MDC 090095-O	WC... 06T308	P0350903	XT15	MDO 09009527
95-100	184251300	MDC 095100-I	184064200	MDC 095100-O	WC... 06T308	P0350903	XT15	MDO 09510027
<b>3 INSERTS PER CARTRIDGE</b>								
100-105	184251400	MDC 100105-I	184064300	MDC 100105-O	WC... 050308	P0300701	XT08	MDO 10010532
105-110	184251500	MDC 105110-I	184253100	MDC 105110-O	WC... 06T308	P0350903	XT15	MDO 10511032
110-115	184251600	MDC 110115-I	184253200	MDC 110115-O	WC... 06T308	P0350903	XT15	MDO 11011532
115-120	184251700	MDC 115120-I	184253300	MDC 115120-O	WC... 06T308	P0350903	XT15	MDO 11512040
120-125	184251800	MDC 120125-I	184253400	MDC 120125-O	WC... 06T308	P0350903	XT15	MDO 12012540
125-130	184251900	MDC 125130-I	184253500	MDC 125130-O	WC... 06T308	P0350903	XT15	MDO 12513040
130-135	184252000	MDC 130135-I	184068900	MDC 130135-O	WC... 06T308	P0350903	XT15	MDO 13013540
135-140	184252100	MDC 135140-I	184069000	MDC 135140-O	WC... 06T308	P0350903	XT15	MDO 13514040
140-150	184252200	MDC 140150-I	184253600	MDC 140150-O	WC... 080408	P0401101	XT15	MDO 14015050
150-160	184252300	MDC 150160-I	184069200	MDC 150160-O	WC... 080408	P0401101	XT15	MDO 15016050
160-170	184252400	MDC 160170-I	184069300	MDC 160170-O	WC... 080408	P0401101	XT15	MDO 16017050
170-180	184252500	MDC 170180-I	184069400	MDC 170180-O	WC... 080408	P0401101	XT15	MDO 17018050



## VORTEX SPARE PARTS - SCREWS

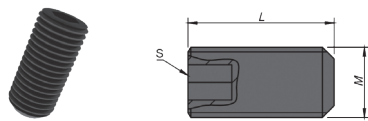
Vortex Drill	(3) Fixing Screw for Pilot Drill		(4) Clamping Bolt for Pilot Drill		(5) Adjustment Screw for Pilot Drill		(7) Screw for Cartridge	
	Order Code	Screw	Order Code	Screw	Order Code	Screw	Order Code	Screw
MDO 04505013	290040100	P0400875	290040400	P0601075	290041400	P0601076	290042500	P0401078
MDO 05005513	290040100	P0400875	290040400	P0601075	290041400	P0601076	290042500	P0401078
MDO 05506016	290040100	P0400875	290040600	P0801275	290041500	P0801576	290042700	P0501278
MDO 06006516	290040200	P0500875	290040600	P0801275	290041500	P0801576	290042700	P0501278
MDO 06507016	290040200	P0500875	290040600	P0801275	290041500	P0801576	290042700	P0501278
MDO 07007522	290040200	P0500875	290040700	P0801575	290041500	P0801576	290042700	P0501278
MDO 07508022	290040400	P0601075	290040900	P1002075	290041600	P1001676	290043000	P0601279
MDO 08008522	290040400	P0601075	290040900	P1002075	290041600	P1001676	290043100	P0601479
MDO 08509027	290040400	P0601075	290040900	P1002075	290041700	P1001876	290043600	P0601679
MDO 09009527	290040400	P0601075	290040900	P1002075	290041700	P1001876	290043600	P0601679
MDO 09510027	290040400	P0601075	290040900	P1002075	290041700	P1001876	290043600	P0601679
MDO 10010532	290040400	P0601075	290041000	P1202075	290041800	P1202076	290043300	P0801879
MDO 10511032	290040400	P0601075	290041000	P1202075	290041800	P1202076	290043300	P0801879
MDO 11011532	290040400	P0601075	290041000	P1202075	290041800	P1202076	290043300	P0801879
MDO 11512040	290040400	P0601075	290041100	P1202575	290041900	P1402076	290043400	P0802079
MDO 12012540	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 12513040	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 13013540	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 13514040	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 14015050	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 15016050	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 16017050	290040400	P0601075	290041300	P1602575	290041900	P1402076	290043500	P0802579
MDO 17018050	290040400	P0601075	290041300	P1602575	290041900	P1402076	290043500	P0802579

(9) Fixation Screw for MDS Shank, MDE Extension, MDM Reducer		
ØD / ØD1	Order Code Código	Screw
28	290032400	P0801280
32	290032400	P0801280
40	290032500	P1001580
48	290032600	P1201880
58	290039600	P1202080
70	290032800	P1602780
80	290032800	P1602780



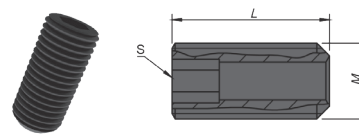
## VORTEX SPARE PARTS - SCREWS

### Fixing Screw and Clamping Bolt for Pilot Drill (DIN 916)



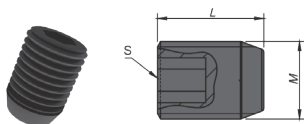
Order Code Código	Screw	Dimensions   Dimensões   Dimensiones (mm)		
		M	L	S
290040100	P0400875	M4 x 0,7	8,0	2,0
290040200	P0500875	M5 x 0,8	8,0	2,5
290040400	P0601075	M6 x 1,0	10,0	3,0
290040500	P0601275	M6 x 1,0	12,0	3,0
290040700	P0801575	M8 x 1,25	15,0	4,0
290040900	P1002075	M10 x 1,5	20,0	5,0
290041000	P1202075	M12 x 1,75	20,0	6,0
290041100	P1202575	M12 x 1,75	25,0	6,0
290041200	P1402575	M14 x 2,0	25,0	6,0
290041300	P1602575	M16 x 2,0	25,0	8,0

### Adjustment Screw for Pilot Drill (DIN 916 w/ hole)



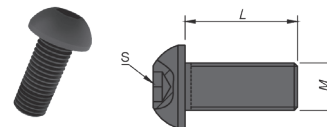
Order Code Código	Screw	Dimensions   Dimensões   Dimensiones (mm)		
		M	L	S
290041400	P0601076	M6 x 1,0	10,0	3,0
290041500	P0801576	M8 x 1,25	15,0	4,0
290041600	P1001676	M10 x 1,5	16,0	5,0
290041700	P1001876	M10 x 1,5	18,0	5,0
290041800	P1202076	M12 x 1,75	20,0	6,0
290041900	P1402076	M14 x 2,0	20,0	6,0

### Fixation Screw for MDS Shank, MDE Extension, MDM Reducer



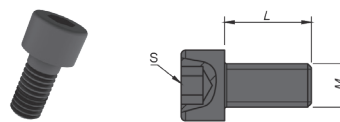
Order Code Código	Screw	Dimensions   Dimensões   Dimensiones (mm)		
		M	L	S
290032400	P0801280	M8	12,0	4,0
290032500	P1001580	M10	15,0	5,0
290032600	P1201880	M12	18,0	6,0
290039600	P1202080	M12	20,0	6,0
290032800	P1602780	M16	27,0	8,0

### Screw for Cartridge (ISO 7380)



Order Code Código	Screw	Dimensions   Dimensões   Dimensiones (mm)		
		M	L	S
290042500	P0401078	M4 x 0,7	10,0	2,0
290042700	P0501278	M5 x 0,8	12,0	2,5

### Screw for Cartridge (DIN 912)



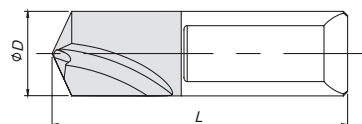
Order Code Código	Screw	Dimensions   Dimensões   Dimensiones (mm)		
		M	L	S
290043000	P0601279	M6 x 1,0	12,0	2,5
290043100	P0601479	M6 x 1,0	14,0	3,0
290043600	P0601679	M6 x 1,0	16,0	3,0
290043300	P0801879	M8 x 1,25	18,0	4,0
290043400	P0802079	M8 x 1,25	20,0	4,0
290043500	P0802579	M8 x 1,25	25,0	4,0

### Insert Screw

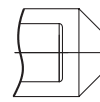


Order Code	Screw
290030600	P0220500
290033100	P0250503
290030800	P0300701
290030900	P0350903
290031000	P0401101

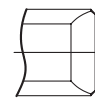
## PILOT DRILL



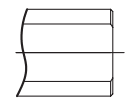
Shank Type



A (with cone)



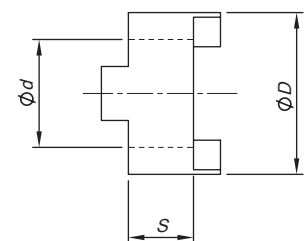
B (with chamfer)



C

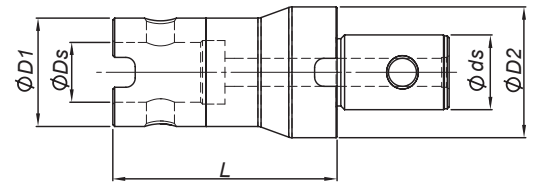
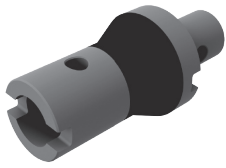
Order Code	Reference	Dimensions   Dimensões   Dimensiones (mm)		Type	Oil Hole	For Drill
		ØD	L			
184033100	MDP 3510	10	35	B	✓	MDO (Ø45-Ø55)
184033200	MDP 3812	12	38	B	✓	MDO (Ø55-Ø75)
184033300	MDP 4516	16	45	B	✓	MDO (Ø75-Ø100)
184033400	MDP 4520	20	45	C	✓	MDO (Ø100-Ø120)
184033500	MDP 5625	25	56	C	✓	MDO (Ø120-Ø160)
184033600	MDP 6830	30	68	C	✓	MDO (Ø160-Ø180)



## DRIVE RING



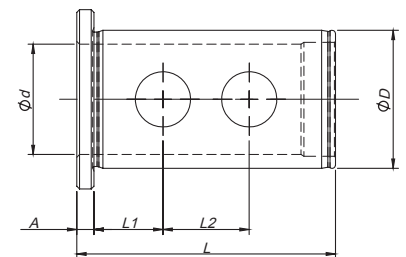
Order Code	Reference	Dimensions   Dimensões   Dimensiones (mm)		
		ØD	Ød	S
184021600	MDR 1028	28	13	10
184021700	MDR 1032	32	16	10
184022100	MDR 1240	40	22	12
184022200	MDR 1248	48	27	12
184022300	MDR 1458	58	32	14
184022400	MDR 1470	70	40	14
184022500	MDR 1680	80	50	16

## MDM - REDUCER



Order Code	Reference	Dimensions   Dimensões   Dimensiones (mm)					Drive Ring D1	Drive Ring D2
		$\varnothing Ds$	$\varnothing ds$	$\varnothing D1$	$\varnothing D2$	L		
184253900	MDM 16100130	13	16	28	32	100	MDR 1028	MDR 1032
184254000	MDM 22100160	16	22	32	40	100	MDR 1032	MDR 1240
184254100	MDM 27100220	22	27	40	48	100	MDR 1240	MDR 1248
184254200	MDM 32100130	13	32	28	58	100	MDR 1028	MDR 1458
184254300	MDM 32100160	16	32	32	58	100	MDR 1032	MDR 1458
184254400	MDM 32100220	22	32	40	58	100	MDR 1240	MDR 1458
184254500	MDM 32100270	27	32	48	58	100	MDR 1248	MDR 1458
184254600	MDM 40100320	32	40	58	70	100	MDR 1458	MDR 1470
184254700	MDM 50080130	13	50	28	80	80	MDR 1028	MDR 1680
184254800	MDM 50080160	16	50	32	80	80	MDR 1032	MDR 1680
184254900	MDM 50080220	22	50	40	80	80	MDR 1240	MDR 1680
184255000	MDM 50080270	27	50	48	80	80	MDR 1248	MDR 1680
184255100	MDM 50080320	32	50	58	80	80	MDR 1458	MDR 1680
184250200	MDM 50150400	40	50	70	80	150	MDR 1470	MDR 1680

## RDS - DRILL SLEEVE



Order Code	Reference	Dimensions   Dimensões   Dimensiones (mm)					
		$\varnothing D$	$\varnothing d$	L	L1	L2	A
184258900	RDS 203265	32	20	65	20	-	5
184259000	RDS 253265	32	25	65	20	20	5
184259100	RDS 204075	40	20	75	20	-	5
184259200	RDS 254075	40	25	75	20	25	5
184259300	RDS 324075	40	32	75	20	25	5
184259400	RDS 205095	50	20	95	35	-	5
184259500	RDS 255095	50	25	95	35	-	5
184259600	RDS 325095	50	32	95	35	35	5
184259700	RDS 405095	50	40	95	35	35	5

# TECHNICAL DATA || Datos técnicos | Datos técnicos

		1	5	10	15	20	25	30	35	40	45	50		
DRILLING	P STEEL		PH6910										PVD	
				PH6920										
				PHU920						NEW				
						PH6930								
						PHC930								
Inserts	M STAINLESS STEEL			PH6920									PVD	
				PHU920						NEW				
						PH6930								
						PHC930								
Jet Drill	K CAST IRON		PH6910										PVD	
				PH6920										
				PHU920						NEW				
						PH6930								
						PHC930								
Vortex Drill	N ALUMINIUM		PH0910										UNC	
Solid Carbide Drills														
Spare Parts														
Technical Data														

## PVD GRADES

### PH6910

P05-P10  
K05-K10

Coated carbide grade with a very hard substrate for drilling of steels and cast irons.

### PH6920

P10-P35  
M10-M25  
K10-K30

Coated grade over a tough wear resistance substrate for general purpose machining.

### PH6930

P20-P40  
M20-M30  
K20-K40

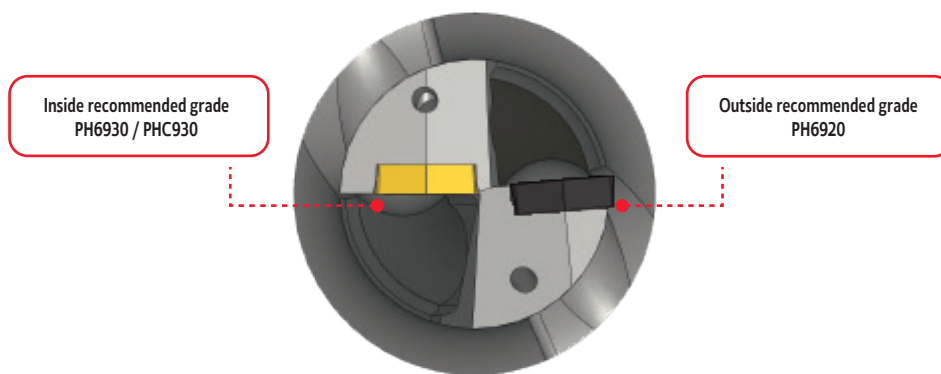
Grade suitable for applications with instability conditions. Excellent solution for medium cutting speed applications.

### PHC930

P20-P40  
M20-M30  
K20-K40

Grade suitable for applications with instability conditions. Excellent solution for medium cutting speed applications. Coated in Yellow to be visually distinguishable.

## Grades recommendation for drilling systems



Note: This recommendation should be applied on High Alloy Steels, Stainless Steels and HRSA materials.

## PHU920

Combining both excellent thermal resistance and excellent surface quality, the PHU920 grade is recommended for steels, stainless steels and cast iron.

Because of its surface quality and thermal resistance it is able to prevent built-up-edge in both low-alloy steels and stainless steels, making it a very versatile grade.

- High thermal shock resistance
- Carefully engineered surface quality
- Suitable for dry and wet machining
- Color: Grey

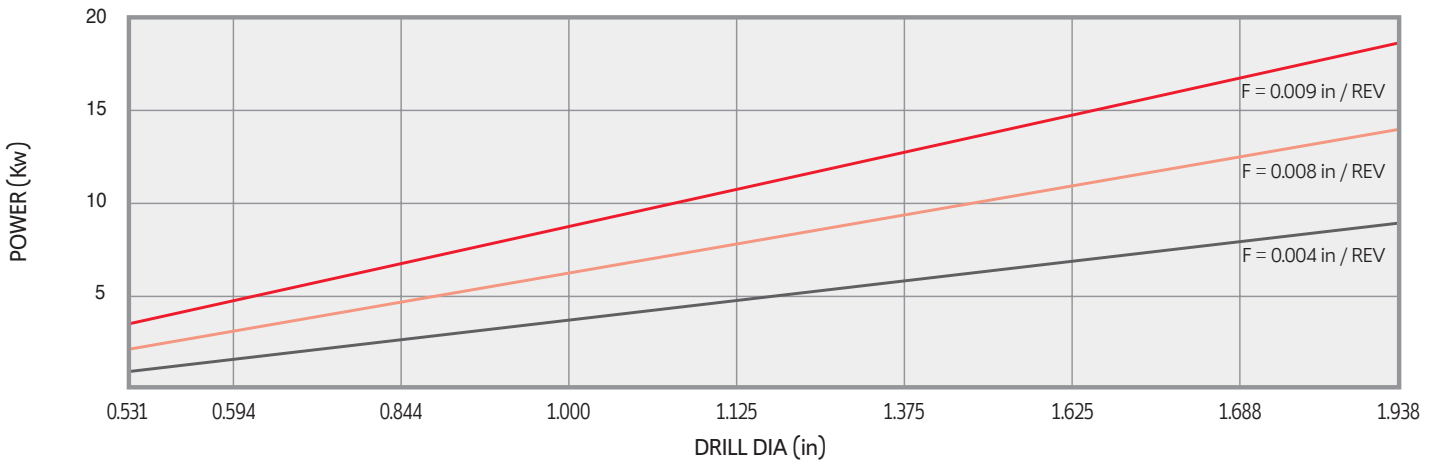


# JET DRILLS = SCI DRILL TYPE

## Recommended Speeds and Feeds | Parâmetros de Corte Recomendados | Recomendaciones de Datos de Corte

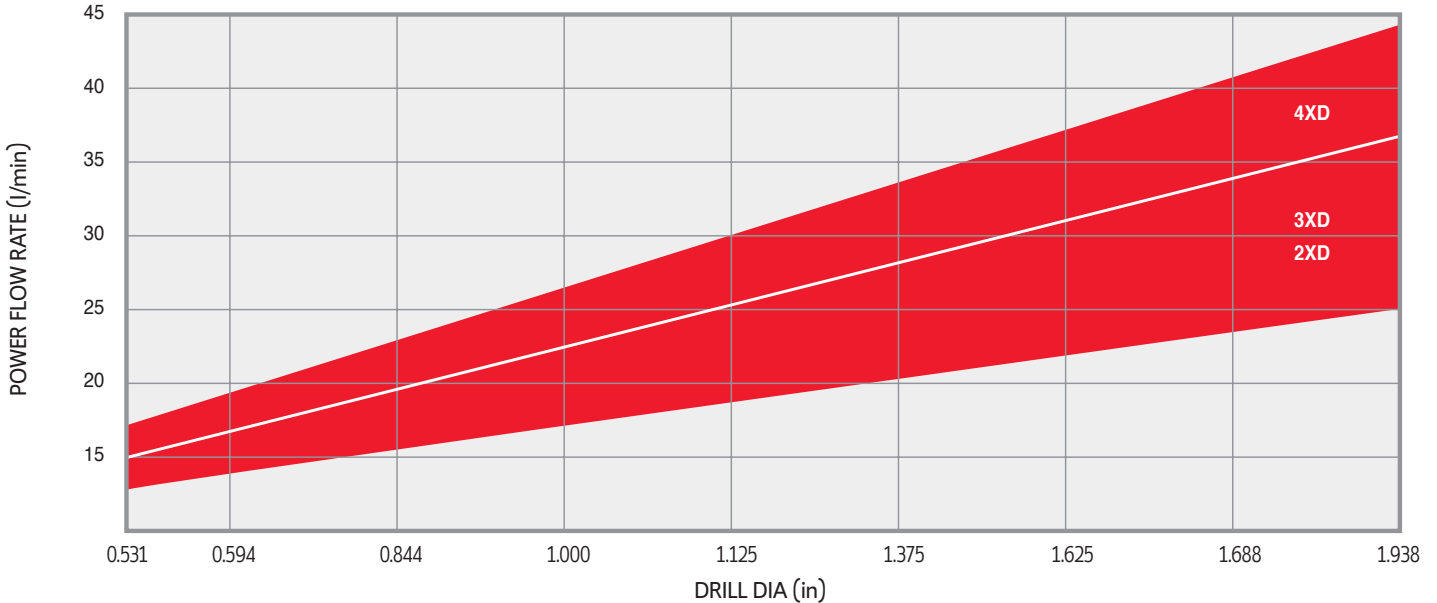
ISO	Material Group Grupo Materiais Grupo Materiales	Vc (SFM)	Feed fz (in/t)					
			Ø0.310-0.594	Ø0.625-0.844	Ø0.875-1.094	Ø1.125-1.313	Ø1.375-1.625	Ø1.688-1.938
P	CARBON STEEL	525-722	0.002-0.005	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.010
	ALLOY STEEL	492-656	0.002-0.005	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.010
	HARDENED STEEL	426-590	0.002-0.004	0.003-0.006	0.004-0.008	0.005-0.009	0.005-0.009	0.005-0.009
M	STAINLESS STEEL	558-722	0.002-0.004	0.002-0.005	0.003-0.006	0.004-0.006	0.004-0.007	0.004-0.007
K	GREY CAST IRON	590-820	0.002-0.005	0.003-0.006	0.005-0.008	0.006-0.010	0.006-0.011	0.007-0.012
	NODULAR CAST IRON	426-656	0.002-0.004	0.003-0.006	0.004-0.007	0.005-0.008	0.006-0.009	0.006-0.010
S	HEAT RESISTANT SUPER ALLOYS	98-197	0.002-0.004	0.002-0.006	0.003-0.007	0.004-0.009	0.006-0.009	0.006-0.009

## Power Requirements | Requisitos de Potência | Requisitos de Potencia



- This chart is based on machining experiences using steels with a hardness of 200-250HB and cutting speed of 328 SFM.
- For cast iron the effective power requirement is around 30% lower.

## Coolant Application Chart | Tabela Aplicação de Refrigeração | Tabla Aplicación de Refrigerante





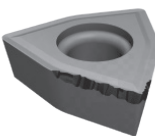
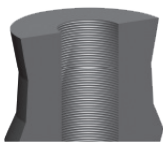


# JET DRILLS = SCI DRILL TYPE

Hole Tolerance and Maximum Hole Size With Radial Adjustment  
 Tolerância do Furo e Dimensão Máxima do Furo com Ajuste Radial  
 Tolerancia de los Agujeros y el Tamaño Del agujero Máximo con Ajuste Radial

Drill D	3xD		
	Normal	Radial Adjust	Max. Hole D
0.512	0.518	0.020	0.551
0.551	0.555	0.020	0.591
0.591	0.594	0.020	0.630
0.630	0.633	0.020	0.669
0.669	0.672	0.020	0.709
0.709	0.711	0.020	0.748
0.748	0.751	0.020	0.787
0.787	0.790	0.020	0.827
0.827	0.826	0.010	0.846
0.866	0.864	0.020	0.906
0.906	0.909	0.020	0.945
0.945	0.949	0.020	0.984
0.984	0.987	0.020	1.024
1.024	1.025	0.010	1.043
1.063	1.065	0.010	1.083
1.102	1.107	0.020	1.142
1.142	1.124	0.020	1.181
1.181	1.190	0.020	1.220
1.220	1.223	0.010	1.240
1.260	1.262	0.010	1.280
1.299	1.304	0.010	1.319
1.339	1.343	0.020	1.378
1.378	1.381	0.020	1.417
1.417	1.419	0.020	1.457
1.457	1.462	0.020	1.496
1.496	1.498	0.020	1.535
1.535	1.537	0.020	1.575
1.575	1.575	0.010	1.594
1.614	1.614	0.010	1.634
1.654	1.655	0.020	1.693
1.693	1.693	0.020	1.732
1.732	1.739	0.020	1.772
1.772	1.780	0.020	1.811
1.811	1.818	0.020	1.850
1.850	1.856	0.020	1.890
1.890	1.894	0.010	1.909
1.929	1.929	0.010	1.949
1.969	1.969	0.010	1.988

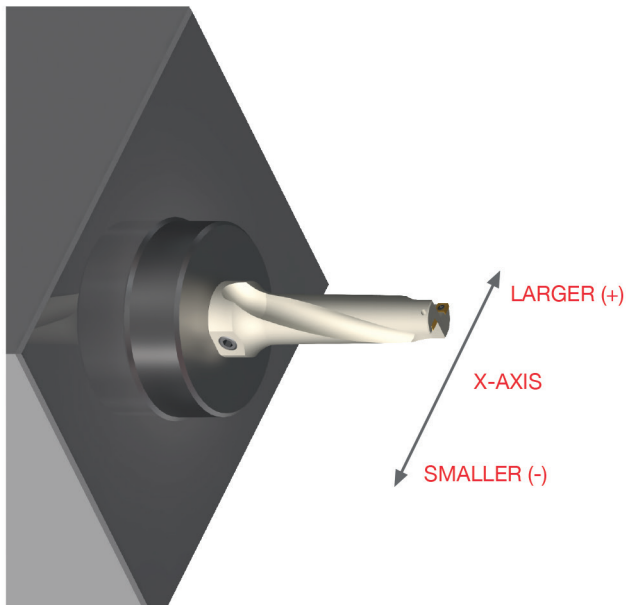
Drill D	4xD		
	Normal	Radial Adjust	Max. Hole D
0.512	0.520	0.020	0.551
0.551	0.557	0.020	0.591
0.591	0.597	0.020	0.630
0.630	0.633	0.020	0.669
0.669	0.674	0.020	0.709
0.709	0.717	0.020	0.748
0.748	0.755	0.020	0.787
0.787	0.789	0.020	0.827
0.827	0.827	0.010	0.846
0.866	0.867	0.020	0.906
0.906	0.909	0.020	0.945
0.945	0.951	0.020	0.984
0.984	0.989	0.020	1.024
1.024	1.027	0.010	1.043
1.063	1.061	0.010	1.083
1.102	1.101	0.020	1.142
1.142	1.144	0.020	1.181
1.181	1.186	0.020	1.220
1.220	1.225	0.010	1.240
1.260	1.264	0.010	1.280
1.299	1.306	0.010	1.319
1.339	1.344	0.020	1.378
1.378	1.383	0.020	1.417
1.417	1.420	0.020	1.457
1.457	1.464	0.020	1.496
1.496	1.499	0.020	1.535
1.535	1.539	0.020	1.575
1.575	1.577	0.010	1.594
1.614	1.616	0.010	1.634
1.654	1.657	0.020	1.693
1.693	1.694	0.020	1.732
1.732	1.741	0.020	1.772
1.772	1.782	0.020	1.811
1.811	1.820	0.020	1.850
1.850	1.858	0.020	1.890
1.890	1.896	0.010	1.909
1.929	1.931	0.010	1.949
1.969	1.971	0.010	1.988

Problem   Problema	Corrective Action	Possível Solução	Solución Posible
<b>INNER CUTTING EDGE CRACKING</b>  	<b>On Lathes:</b> <ul style="list-style-type: none"> <li>• Check machine alignment.</li> <li>• Check clamping accuracy. If tool clamping cannot be improved and/or optimum machine stability is doubtful, reduce feed by 30%.</li> <li>• User tougher carbide grade.</li> </ul> <p><b>TIP:</b> Grades can be mixed to achieve optimum performance.</p> <p><b>Example:</b> Use grade PH6125 in the inside pocket with PH6135 in the outside pocket.</p>	<b>Em Tornos:</b> <ul style="list-style-type: none"> <li>• Verifique o alinhamento máquina.</li> <li>• Verifique a precisão do aperto. Se o aperto não puder ser melhorado e/ou a otimização da estabilidade da máquina é duvidosa, reduza o avanço em 30%.</li> <li>• Usar classes de graus mais duras.</li> </ul> <p><b>DICA:</b> Misture classes Graus para alcançar o desempenho ideal.</p> <p><b>Exemplo:</b> Utilize PH6125 na pastilha interior e PH6135 na pastilha exterior.</p>	<b>Tornos en:</b> <ul style="list-style-type: none"> <li>• Compruebe la alineación de máquinas.</li> <li>• Verificar la precisión de sujeción. Si la herramienta de sujeción no puede mejorar y/o optimizar la estabilidad de la máquina es dudosa, reducir los piensos en un 30%.</li> <li>• El usuario de carburo de calidad es más estrictas.</li> </ul> <p><b>SUGERENCIA:</b> Las calificaciones se pueden mezclar para lograr un rendimiento óptimo.</p> <p><b>Ejemplo:</b> Utilice PH6125 en el inserto interior e PH6135 en el inserto exterior.</p>
<b>CHIP EVACUATION NOT OPTIMAL</b>  	<ul style="list-style-type: none"> <li>• Increase coolant pressure and volume (coolant helps support chip evacuation as well as cooling the cutting edges).</li> <li>• Optimize chip control for a given application.</li> <li>• Increase cutting speed by 20%.</li> </ul>	<ul style="list-style-type: none"> <li>• Aumente a pressão e volume do líquido de refrigeração (este permite uma melhor evacuação da apar, bem como um arrefecimento das arestas de corte).</li> <li>• Otimize o controlo das aparas para cada operação.</li> <li>• Aumentar a velocidade de corte de 20%.</li> </ul>	<ul style="list-style-type: none"> <li>• Aumentar la presión del refrigerante y el volumen (el líquido de refrigeración de chips de apoyo ayuda a la evacuación, así como el enfriamiento de la corte de los bordes).</li> <li>• Optimizar el control de chip para una aplicación determinada.</li> <li>• Aumentar la velocidad de corte un 20%.</li> </ul>
<b>EXCESSIVE INSERT WEAR</b>  	<ul style="list-style-type: none"> <li>• Increase coolant pressure and volume.</li> <li>• Reduce cutting speed by 20%.</li> <li>• Use a more wear – resistant grade.</li> </ul>	<ul style="list-style-type: none"> <li>• Aumente o volume e a pressão do líquido de refrigeração.</li> <li>• Reduzir a velocidade de corte de 20%.</li> <li>• Utilize um grau mais resistente ao desgaste.</li> </ul>	<ul style="list-style-type: none"> <li>• Aumentar la presión del refrigerante y el volumen.</li> <li>• Reducir la velocidad de corte en un 20%.</li> <li>• Utilice un mayor desgaste - resistente grado.</li> </ul>
<b>POOR DRILL HOLE QUALITY</b>  	<ul style="list-style-type: none"> <li>• Increase coolant pressure and volume.</li> <li>• Increase cutting speed by 20%</li> <li>• Check clamping accuracy (tool and workpiece) for possible improvement.</li> </ul> <p><b>TIP:</b> Use higher speed with lighter feed to produce better hole quality.</p>	<ul style="list-style-type: none"> <li>• Aumente o volume e a pressão do líquido de refrigeração.</li> <li>• Aumentar a velocidade de corte de 20%</li> <li>• Verifique a precisão do aperto (ferramenta e peça).</li> </ul> <p><b>DICA:</b> Utilize velocidades com avanços menores para produzir uma melhor qualidade do furo.</p>	<ul style="list-style-type: none"> <li>• Aumentar la presión del refrigerante y el volumen.</li> <li>• Aumentar la velocidad de corte en un 20%</li> <li>• Verificar la precisión de sujeción(herramienta y pieza de trabajo) para una posible mejora.</li> </ul> <p><b>SUGERENCIA:</b> El uso ligero con mayor velocidad de alimentación para producir una mejor calidad agujero.</p>

# JET DRILLS - TECHNICAL INFORMATION FOR LATHE APPLICATIONS

Informação técnica para aplicações | Información técnica para aplicaciones

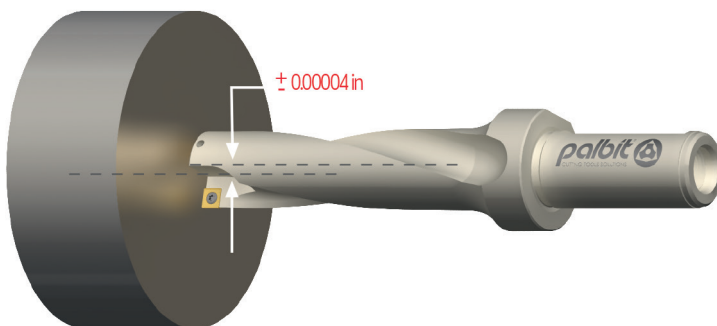
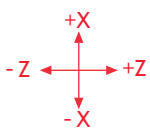
## Initial Drill Set Up and Check | Ajuste Inicial da Broca e Verificação | Ajuste Inicial de la Broca e su Verificación



- The cutting edge of insert should be parallel to X-axis to make it possible to do offset cutting. Since a flat part on shank for side lock clamping has been made parallel with the cutting edge line of insert, operator can set the drill as per flat part of shank.

- A aresta de corte da pastilha deve ser paralela ao eixo X tornando possível o alinhamento de corte.

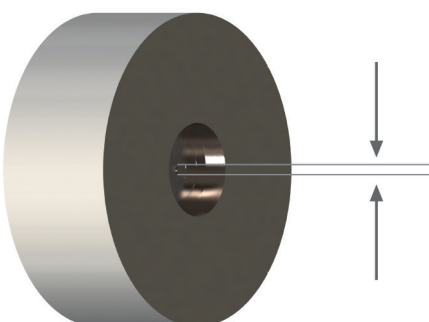
- El hilo de corte del inserto se debe posicionar paralelamente al axis-X tornando posible el alineamiento de corte.



- The outer insert should be located in the direction (+) of X-axis to allow offset cutting and then the inner insert should face the operator.

- A pastilha exterior deve estar localizada na direção (+) do eixo-X, permitindo assim o alinhamento do corte, a pastilha interior deve estar virada ao operador.

- El inserto exterior se debe localizar en la dirección (+) del axis-X, permitiendo el alineamiento del corte, el inserto interior debe quedar-se virado para el operador.



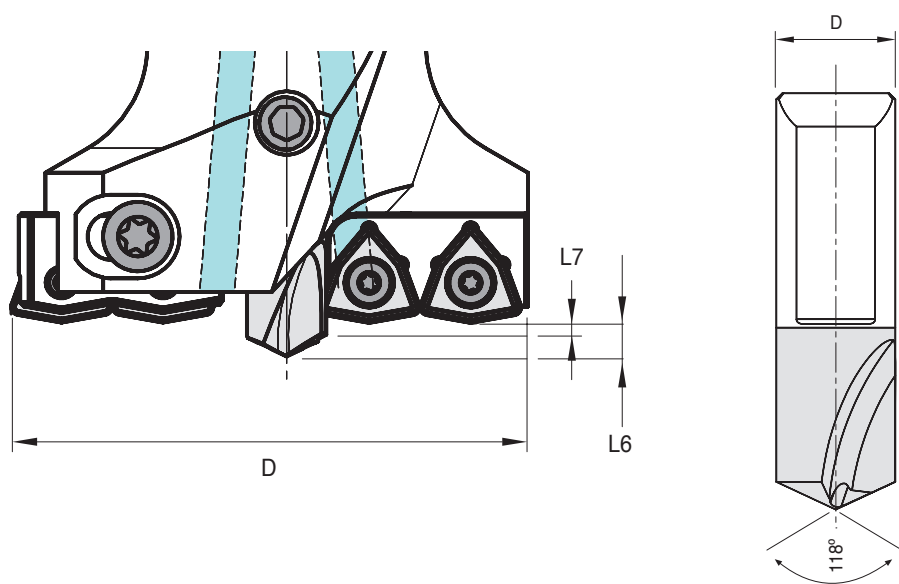
- To check the setting of drill before use, test it by drilling about 0.200 in depth and then measure the core size if it is around 0.008 in - 0.027 in.

- Para verificar o ajuste faça o teste furando cerca de 0.200 in de profundidade medindo depois o núcleo verificando se este tem aproximadamente 0.008 in - 0.027 in.

- Para comprobar el ajuste hacer un taladro de cerca de 0.200 in de profundidad, medido después su núcleo si se trata de 0.008 in - 0.020 in.

Parâmetros de corte e ajustes | Condiciones de corte y ajustes

## Pilot Drill Adjustment | Ajuste da Broca Piloto | Ajuste de la Broca Piloto



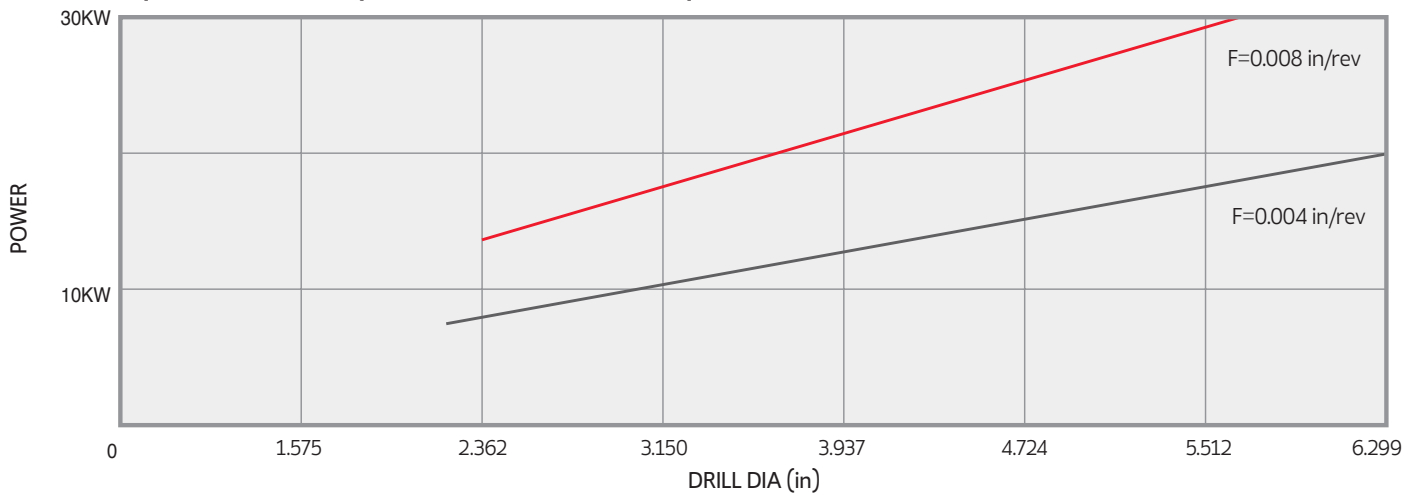
Dc (mm)	2D to 4D		4D to 6D		> 6D	
	L7	L6	L7	L6	L7	L6
45-55	1,6	4,0	1,8	4,2	2,0	4,4
55-75	1,8	5,4	2,0	5,6	2,2	5,8
75-100	2,2	6,5	2,5	6,8	2,8	7,1
100-120	2,4	7,7	2,8	8,1	3,2	8,5
120-170	3,2	9,9	3,6	10,3	4,0	10,7
170-180	3,5	12,2	3,9	12,6	4,3	13,0

Parâmetros de corte e ajustes | Condiciones de corte y ajustes

## Recommended Speeds and Feeds | Parâmetros de Corte Recomendados Recomendaciones de Datos de Corte

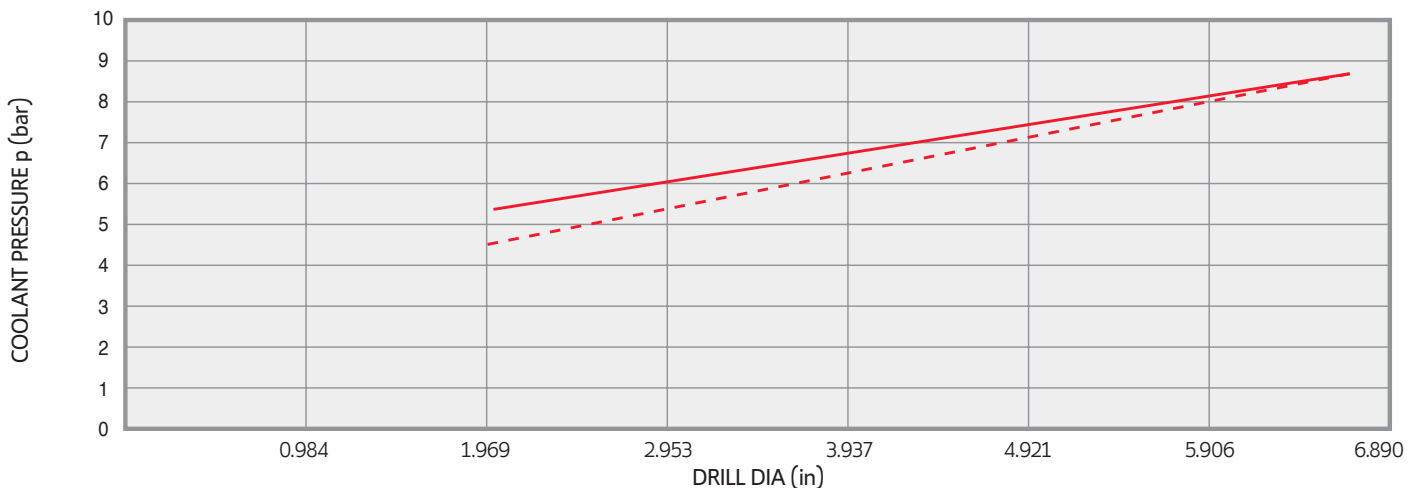
ISO	Material Group Grupo Materiais Grupo Materiales	Vc (SFM)	Feed fz (in/t)						
			Ø45-55 mm	Ø55-60 mm	Ø60-75 mm	Ø75-100 mm	Ø100-105 mm	Ø105-150 mm	Ø150-180 mm
<b>P</b>	UNALLOYED STEEL (-0.25%)	394-591	0.003-0.004	0.003-0.005	0.004-0.005	0.004-0.006	0.006-0.008	0.004-0.005	0.004-0.006
	LOW-ALLOY STEEL (0.25%-)	361-558	0.003-0.004	0.003-0.005	0.004-0.005	0.004-0.006	0.005-0.008	0.004-0.005	0.004-0.006
	LOW-ALLOY STEEL (-HB300)	296-427	0.003-0.004	0.003-0.005	0.004-0.005	0.004-0.006	0.005-0.008	0.004-0.005	0.004-0.006
	HIGH-ALLOY STEEL (HB300-)	197-328	0.002-0.003	0.002-0.003	0.003-0.004	0.003-0.004	0.004-0.006	0.003-0.004	0.003-0.004
<b>M</b>	STAINLESS STEEL	197-361	0.002-0.003	0.002-0.005	0.003-0.005	0.004-0.006	0.004-0.008	0.003-0.005	0.004-0.006
<b>K</b>	GREY CAST IRON	394-591	0.003-0.006	0.003-0.006	0.004-0.007	0.004-0.008	0.005-0.009	0.004-0.007	0.004-0.008
	CAST IRON WITH NODULAR CAST	328-591	0.002-0.006	0.003-0.006	0.004-0.007	0.004-0.010	0.005-0.011	0.004-0.007	0.004-0.010

## Power Requirements | Requisitos de Potência | Requisitos de Potencia



• These chart is based on machining experiences using steels with a hardness of 200-250HB and cutting speed of 328 SFM.

## Coolant Application Chart | Tabela Aplicação de Refrigeração | Tabla Aplicación de Refrigerante

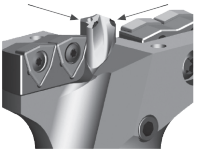
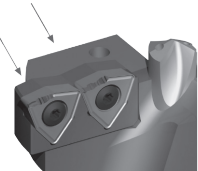
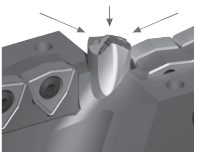

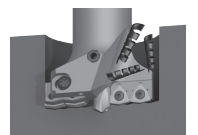


Parâmetros de corte e ajustes | Condiciones de corte y ajustes

## Rules & Tips | Regras e Dicas | Normas e Consejos

	WRONG	CORRECT	EN	PT	ES
DRILLING			<p><b>Spot Drilling</b></p> <p>For plain/straight surfaces, no spot drilling is required. For centering, the center drill diameter should be considerably smaller than the pilot drill diameter.</p>	<p><b>Perfuração Localizada</b></p> <p>Para superfícies planas a perfuração localizada não é necessária. O diâmetro da broca de pré-furação deve ser consideravelmente menor do que o diâmetro da broca-piloto.</p>	<p><b>Perforación Localizada</b></p> <p>Para superficies planas, no se requiere la perforación in situ. Para centrar el diámetro de pré-perforación debe ser considerablemente más pequeño que el diámetro de la broca piloto.</p>
Inserts			<p><b>Spot drilling and drilling through on inclined surfaces.</b></p> <p>Up to an 8° inclination angle is possible. Drilling through at a maximum of 4° is possible; otherwise, a pre-facing operation is necessary.</p>	<p><b>Perfuração localizada e perfuração através de superfícies inclinadas.</b></p> <p>Até 8° ângulo de inclinação é possível. Perfuração até a um máximo de 4° é possível, caso contrário, é necessária uma pré-operação.</p>	<p><b>Perforación localizada y perforación sobre superficies inclinadas.</b></p> <p>Hasta un ángulo de inclinación de 8° es posible. A través de la perforación en un máximo de 4° es posible, de otro modo, es necesaria pre-operación.</p>
Jet Drill			<p><b>Multi-Stage Drill Hole</b></p> <p>Vortex series drills are not recommended for boring operations. First, use the Integrex drill to drill a larger diameter hole. Then, use a solid carbide drill for smaller holes. Optimum centering of the solid carbide drill is possible on the drill hole of the pilot drill.</p>	<p><b>Furo Multi-Estágio</b></p> <p>As brocas Vortex não são recomendadas para operações de mandrilagem. Primeiro utilize a Integrex para o furo de diâmetro maior, então use uma broca Metal Duro Integrex para o furo de diâmetro mais reduzido.</p>	<p><b>Multi-etapa taladro</b></p> <p>Las brocas Vortex no son recomendadas para las operaciones de mandrilagen. En primer lugar, utilizar la Integrex para perforar un agujero de diámetro mayor. A continuación, utilice una broca de carburo sólido para los pequeños agujeros. Centrado óptimo del taladro de carburo sólido es posible en el taladro de la broca piloto.</p>
Vortex Drill			<p><b>Drilling of stacked plates</b></p> <p>This is not possible with Integrex series drills because a final disc forms when the drill breaks through.</p> <p><b>Caution:</b> During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect all bystanders.</p>	<p><b>Perfuração de chapas empilhadas</b></p> <p>Isso não é possível com a Integrex porque um disco final forma-se quando a broca passa</p> <p><b>Cuidado:</b> Durante operações de trespassar uma placa, uma apara ou disco é produzido quando a broca rompe através da peça. Quando a broca está parada e é a peça rotativa, este disco pode ser arremessado da brecha pela força centrífuga. Proporcionar adequada blindagem para proteger todos os transeuntes.</p>	<p><b>Perforación de placas apiladas</b></p> <p>Esto no es posible con la Integrex debido a un disco que se forma cuando el taladro a través de las placas.</p> <p><b>Precaución:</b> Durante las operaciones a través de agujeros, una babosa o disco se produce como la herramienta provocando saltos de la pieza. Cuando la perforación es estacionaria y la pieza está girando, este disco puede ser lanzado desde el plato por la fuerza centrífuga. Proporcionar la protección adecuada para proteger a todos los transeuntes.</p>
Solid Carbide Drills					
Spare Parts					
Technical Data					

Solução de problemas | Solución de problemas

Problem   Problema	Corrective Action	Possível Solução	Solución Posible
<b>PILOT DRILL CRACKING</b> 	<b>On Lathes:</b> <ul style="list-style-type: none"> <li>• Verify that the tool is centered correctly. Readjust machine, if necessary.</li> <li>• Check clamping accuracy (tool and workpiece).</li> </ul>	<b>Em Tornos:</b> <ul style="list-style-type: none"> <li>• Verifique se a ferramenta está centrada correctamente. Reajustar a máquina caso necessário.</li> <li>• Verifique a precisão do aperto (ferramento e peça).</li> </ul>	<b>Tornos en:</b> <ul style="list-style-type: none"> <li>• Compruebe que la herramienta se centra correctamente. Reajustar la máquina, si es necesario.</li> <li>• Verificar la precisión de sujeción (herramienta y pieza de trabajo) para una posible mejora.</li> </ul>
<b>INSERT CRACKING</b> 	<ul style="list-style-type: none"> <li>• Use tougher carbide grade.</li> <li>• Check clamping accuracy (tool and workpiece) for possible run out.</li> </ul>	<ul style="list-style-type: none"> <li>• Use classes de graus mais duras.</li> <li>• Verifique a precisão do aperto (ferramento e peça).</li> </ul>	<ul style="list-style-type: none"> <li>• Uso más duras de carburo de grado.</li> <li>• Verificar la precisión de sujeción (herramienta y pieza de trabajo) para su posible run out.</li> </ul>
<b>EXCESSIVE INSERT WEAR</b> 	<ul style="list-style-type: none"> <li>• Use coated pilot drill.</li> <li>• Increase coolant pressure and volume.</li> <li>• Reduce speed by 20%</li> <li>• Use wear &amp; resistant carbide grade.</li> </ul>	<ul style="list-style-type: none"> <li>• Utilizar uma broca piloto revestida.</li> <li>• Aumentar o volume e a pressão do líquido de refrigeração.</li> <li>• Reduzir a velocidade de corte em 20%.</li> <li>• Utilizar classes de graus mais resistentes ao desgaste.</li> </ul>	<ul style="list-style-type: none"> <li>• Utilice broca piloto revestida.</li> <li>• Aumentar la presión del refrigerante y el volumen.</li> <li>• Reduzca la velocidad en un 20%</li> <li>• Utilice el desgaste y resistentes de carburo de grado.</li> </ul>
<b>CHIP BREAKING NOT OPTIMAL</b> 	<ul style="list-style-type: none"> <li>• Optimize chip control for given application by using different chipbreaker geometry.</li> <li>• Increase cutting speed by 20%; reduce feed by 20%.</li> </ul>	<ul style="list-style-type: none"> <li>• Optimizar o controlo da apar numa determinada operação outra geometria de quebra aparas.</li> <li>• Aumentar a velocidade de corte em 20% e reduzir o avanço em 20%.</li> </ul>	<ul style="list-style-type: none"> <li>• Optimizar el control de viruta numa dada aplicación mediante utilización de otra geometría quebra viruta</li> <li>• Aumentar la velocidad de corte en un 20%, reducir la alimentación en un 20%.</li> </ul>
<b>CHIP EVACUATION NOT OPTIMAL, POOR DRILL HOLE QUALITY</b> 	<ul style="list-style-type: none"> <li>• Increase coolant pressure and volume.</li> <li>• Increase cutting speed by 20%.</li> </ul>	<ul style="list-style-type: none"> <li>• Aumentar o volume e a pressão do líquido de refrigeração.</li> <li>• Aumentar a velocidade de corte em 20%.</li> </ul>	<ul style="list-style-type: none"> <li>• Aumentar la presión del refrigerante y el volumen.</li> <li>• Aumentar la velocidad de corte en un 20%.</li> </ul>

## SAFETY

### Caution:

• During trough-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect all bystanders.

• When drilling through, a small shoulder will be produced on breakthrough as the pilot drill is no longer cutting.



# SOLID CARBIDE DRILLS - CUTTING PARAMETERS AND ADJUSTMENTS

Parâmetros de corte e ajustes | Condiciones de corte y ajustes

DRILLING

DRILLING

Inserts

Jet Drill

Vortex Drill

Solid Carbide Drills

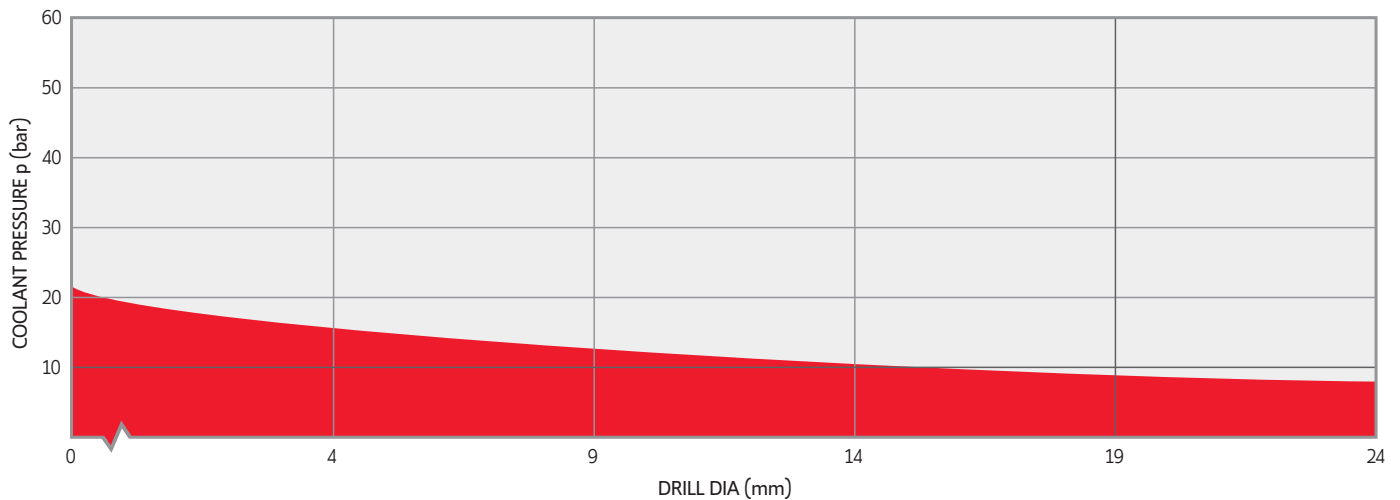
Spare Parts

Technical Data

## Recommended Speeds and Feeds | Parâmetros de Corte Recomendados Recomendaciones de Datos de Corte

ISO	Material Group Grupo Materiais Grupo Materiales	Vc (SFM)	f (in/rev)			
			Ø3-8mm	Ø8-12mm	Ø12-16mm	Ø16-20mm
<b>P</b>	UNALLOYED STEEL (-0,25%)	263-328	0,004-0,008	0,006-0,010	0,008-0,016	0,010-0,02
	LOW-ALLOY STEEL (0,25%-)	230-328	0,004-0,008	0,008-0,012	0,008-0,014	0,010-0,016
	HIGH-ALLOY STEEL	132-230	0,004-0,006	0,005-0,009	0,008-0,016	0,010-0,016
<b>M</b>	STAINLESS STEEL	115-164	0,004-0,006	0,005-0,010	0,006-0,012	0,008-0,014
<b>K</b>	MALEABLE CAST IRON	230-328	0,004-0,012	0,008-0,016	0,010-0,016	0,010-0,020
	GREY CAST IRON	230-328	0,004-0,010	0,008-0,014	0,012-0,018	0,014-0,022

## Coolant Application Chart | Tabela Aplicação de Refrigeração | Tabla Aplicación de Refrigerante



# SOLID CARBIDE DRILLS - CUTTING PARAMETERS AND ADJUSTMENTS

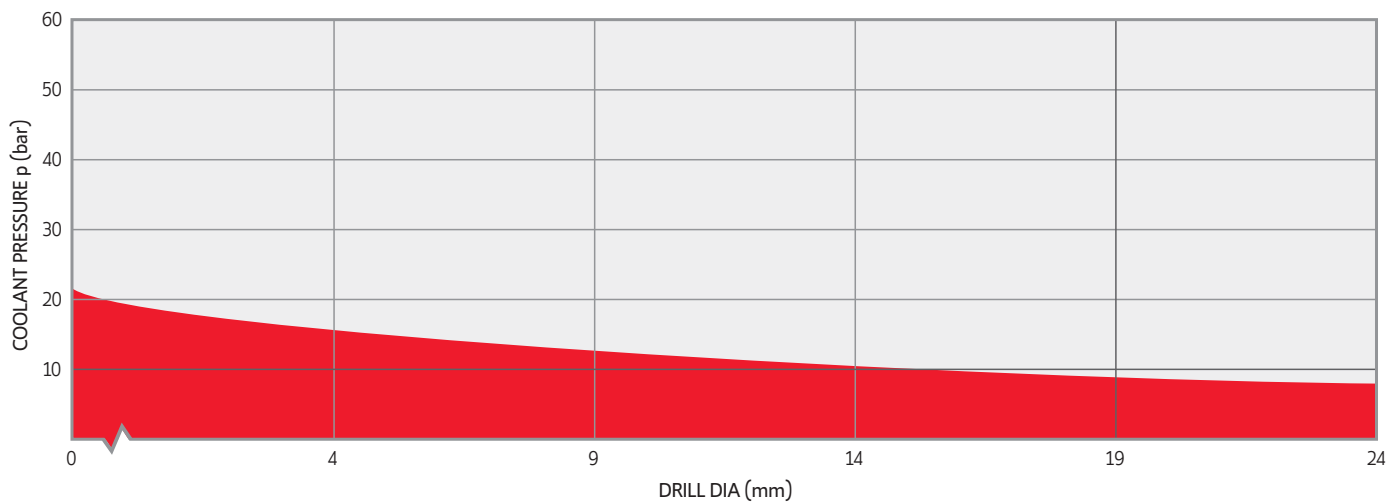
Parâmetros de corte e ajustes | Condiciones de corte y ajustes



## Recommended Speeds and Feeds | Parâmetros de Corte Recomendados Recomendaciones de Datos de Corte

ISO	Material Group Grupo Materiais Grupo Materiales	Vc (m/min)	f (mm/rev)			
			Ø3-8mm	Ø8-12mm	Ø12-16mm	Ø16-20mm
<b>P</b>	UNALLOYED STEEL (-0,25%)	80-100	0,10-0,20	0,15-0,25	0,20-0,40	0,25-0,50
	LOW-ALLOY STEEL (0,25%-)	70-100	0,10-0,20	0,20-0,30	0,20-0,35	0,25-0,40
	HIGH-ALLOY STEEL	40-70	0,08-0,15	0,12-0,22	0,20-0,40	0,25-0,40
<b>M</b>	STAINLESS STEEL	35-50	0,08-0,15	0,12-0,25	0,15-0,30	0,20-0,35
<b>K</b>	MALEABLE CAST IRON	70-100	0,10-0,30	0,20-0,40	0,25-0,40	0,25-0,50
	GREY CAST IRON	70-100	0,10-0,25	0,20-0,35	0,30-0,45	0,35-0,55

## Coolant Application Chart | Tabela Aplicação de Refrigeração | Tabla Aplicación de Refrigerante



DRILLING  
 Inserts  
 Jet Drill  
 Vortex Drill  
 Solid Carbide Drills  
 Spare Parts  
 Technical Data

Problem   Problema	Cause   Causa   Fuente	Possible Solution   Solução   Solución
<b>Heavy wear on the cutting corners</b> Desgaste profundo das arestas de corte Desgaste profundo de los gavilanes	<ul style="list-style-type: none"> <li>Spintering on the cutting corners</li> <li>Estilhamento das esquinas de corte</li> <li>Astillado en las esquinas de corte</li> </ul>	<ul style="list-style-type: none"> <li>Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.</li> <li>Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos os lados.</li> <li>Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfrie desde ambos lados.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Reduce cutting speed, increase feed.</li> <li>Reduza a velocidade de corte, aumente o avanço.</li> <li>Reduzca la velocidad de corte, aumente el avance.</li> </ul>
<b>Spintering on the chisel edge</b> Estilhamento do fio de corte transversal Astillado del filo de corte transversal	<ul style="list-style-type: none"> <li>Clamping chuck</li> <li>Sistema de amarrar</li> <li>Sistema amarrar</li> </ul>	<ul style="list-style-type: none"> <li>Check clamping accuracy. Use hydraulic clamping chuck or high-precision chucking system.</li> <li>Comprove a precisão da fixação utilize uma pinça de fixação hidráulica ou um sistema de aperto de alta precisão.</li> <li>Compruebe la precisión de la fijación. Utilice una pinza de fijación hidráulica o un sistema de amarrar de alta precisión.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Increase feed.</li> <li>Aumente o avanço.</li> <li>Aumente el avance.</li> </ul>
<b>Built-up edge</b> Acrescimento do fio de corte Recrecimiento del filo de corte	<ul style="list-style-type: none"> <li>Insufficient coolant.</li> <li>Refrigeração insuficiente</li> <li>Refrigerante insuficiente</li> </ul>	<ul style="list-style-type: none"> <li>Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.</li> <li>Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados.</li> <li>Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfrie desde ambos lados.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Increase speed 20-30%.</li> <li>Aumente a velocidade em uns 20% a 30%.</li> <li>Aumente la velocidad en un 20-30%.</li> </ul>
<b>Spintering on the cutting edges</b> Estilhamento do fio de corte principal Astillado del filo de corte principal	<ul style="list-style-type: none"> <li>Clamping chuck</li> <li>Sistema de amarrar</li> <li>Sistema amarrar</li> </ul>	<ul style="list-style-type: none"> <li>Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.</li> <li>Comprove a precisão da fixação utilize uma pinça de fixação hidráulica ou um sistema de aperto de alta precisão.</li> <li>Compruebe la precisión de la fijación y la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarrar de alta precisión.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions caused by built-up edge</li> <li>Condições de corte provocadas por acrescimos no fio de corte</li> <li>Condiciones de corte provocadas por recrecimiento del filo de corte</li> </ul>	<ul style="list-style-type: none"> <li>Check cutting values and, possibly increase cutting speed. Examine regularly for built-up edge.</li> <li>Veja os valores de corte e a ser possível aumente a velocidade de corte. Examine regularmente o aumento do fio de corte.</li> <li>Compruebe los valores de corte y a ser posible aumente la velocidad de corte. Examine regularmente el recrecimiento del filo de corte.</li> </ul>
<b>Thermal checking / Comb cracking</b> Desgaste / Rotura dos chanfros Desgaste / Rotura de los chaflanes	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Inconsistent / insufficient coolant supply.</li> <li>Fornecimento de refrigeração, inconsistente/insuficiente.</li> <li>Suministro de refrigerante inconsistente/insuficiente.</li> </ul>
<b>Heavy wear on the cutting corners</b> Desgaste profundo dos chanfros Desgaste profundo de los chaflanes	<ul style="list-style-type: none"> <li>Workpiece movement</li> <li>Movimento das peças de trabalho</li> <li>Movimiento de piezas de trabajo</li> </ul>	<ul style="list-style-type: none"> <li>Stabilize workpiece chucking and check stability of machine tool.</li> <li>Estabilize a fixação da peça de trabalho e veja a estabilidade da máquina ferramenta.</li> <li>Estabilice la fijación de la pieza de trabajo y compruebe la estabilidad de la máquina herramienta</li> </ul>
	<ul style="list-style-type: none"> <li>Insufficient coolant</li> <li>Refrigeração insuficiente</li> <li>Refrigerante insuficiente</li> </ul>	<ul style="list-style-type: none"> <li>Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.</li> <li>Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados.</li> <li>Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfrie desde ambos lados.</li> </ul>
	<ul style="list-style-type: none"> <li>Wrong drill</li> <li>Broca incorrecta</li> <li>Broca incorrecta</li> </ul>	<ul style="list-style-type: none"> <li>Check drill type, drilling depth, cooling system, and workpiece material.</li> <li>Veja o tipo de broca, a profundidade do furo, o sistema de refrigeração e o material de trabalho.</li> <li>Compruebe el tipo de broca, la profundidad de taladrado, el sistema de refrigeración y el material de trabajo.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Check cutting parameters at exit. Reduce feed 15-20% prior to breakout.</li> <li>Revise os parâmetros de corte de saída. Reduza o avanço em uns 15% a 20% antes da rotura.</li> <li>Revise los parámetros de corte de la salida. Reduzca el avance en un 15-20% antes de la rotura.</li> </ul>
<b>Hole too big</b> Furo demasiado grande Orificio demasiado grande	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Check cutting values, increase cutting speed, or reduce feed.</li> <li>Comprove os valores de corte, aumente a velocidade de corte e reduza o avanço.</li> <li>Compruebe los valores de corte, aumente la velocidad de corte o reduzca el avance.</li> </ul>
	<ul style="list-style-type: none"> <li>Clamping chuck</li> <li>Sistema de amarrar</li> <li>Sistema amarrar</li> </ul>	<ul style="list-style-type: none"> <li>Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.</li> <li>Comprove a precisão da fixação utilize uma pinça de fixação hidráulica ou um sistema de aperto de alta precisão.</li> <li>Compruebe la precisión de la fijación y la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarrar de alta precisión.</li> </ul>
	<ul style="list-style-type: none"> <li>Wrong drill</li> <li>Broca incorrecta</li> <li>Broca incorrecta</li> </ul>	<ul style="list-style-type: none"> <li>Check drill diameter. Please notice that drills are ground to a positive tolerance. Check concentric running.</li> <li>Veja o diâmetro da broca. Assegure-se que as brocas estão ligadas a uma tolerância positiva. Comprove que o funcionamento é concêntrico.</li> <li>Compruebe el diámetro de la broca. Asegúrese de que las brocas están conectadas a una tolerancia positiva. Compruebe el funcionamiento concéntrico.</li> </ul>

Problem   Problema	Cause   Causa   Fuente	Possible Solution   Solução   Solución
Hole too small Furo demasiado pequeno Orificio demasiado pequeno	<ul style="list-style-type: none"> <li>Insufficient coolant</li> <li>Refrigeração insuficiente</li> <li>Refrigerante insuficiente</li> </ul>	<ul style="list-style-type: none"> <li>Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjusting positioning of coolant jet. Cool from both sides.</li> <li>Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados.</li> <li>Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfrie desde ambos lados.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Reduce cutting speed; increase feed.</li> <li>Reduza a velocidade de corte, aumente o avanço.</li> <li>Reduzca la velocidad de corte, aumente el avance.</li> </ul>
	<ul style="list-style-type: none"> <li>Wrong drill</li> <li>Broca incorrecta</li> <li>Broca incorrecta</li> </ul>	<ul style="list-style-type: none"> <li>Check cutting-edge diameter.</li> <li>Veja o diâmetro do fio de corte.</li> <li>Compruebe el diámetro del filo de corte.</li> </ul>
Hole not cylindrical Furo não está recto Orificio no es recto	<ul style="list-style-type: none"> <li>Clamping chuck</li> <li>Sistema de amarre</li> <li>Sistema amarre</li> </ul>	<ul style="list-style-type: none"> <li>Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.</li> <li>Veja a precisão da fixação e a transmissão do par. Utilize uma pinça de fixação hidráulica ou um sistema de aperto de alta precisão.</li> <li>Compruebe la precisión de la fijación y la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarre de alta precisión.</li> </ul>
	<ul style="list-style-type: none"> <li>Workpiece movement</li> <li>Movimento das peças de trabalho</li> <li>Movimiento de piezas de trabajo</li> </ul>	<ul style="list-style-type: none"> <li>Stabilize workpiece chucking and check stability of machine tool.</li> <li>Estabilize a fixação da peça de trabalho e veja a estabilidade da máquina ferramenta.</li> <li>Estabilice la fijación de la pieza de trabajo y compruebe la estabilidad de la máquina herramienta.</li> </ul>
	<ul style="list-style-type: none"> <li>Wrong drill</li> <li>Broca incorreta</li> <li>Broca incorrecta</li> </ul>	<ul style="list-style-type: none"> <li>Check drill type and drilling depth. Use longer drills</li> <li>Veja o tipo de broca e a profundidade do furo. Utilize brocas mais largas.</li> <li>Compruebe el tipo de broca y la profundidad de taladrado. Utilice brocas más largas.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Reduce feed at entry.</li> <li>Reduza o avanço de entrada.</li> <li>Reduzca el avance de la entrada.</li> </ul>
	<ul style="list-style-type: none"> <li>Clamping chuck</li> <li>Sistema de amarre</li> <li>Sistema amarre</li> </ul>	<ul style="list-style-type: none"> <li>Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.</li> <li>Veja a precisão da fixação e a transmissão do par. Utilize uma pinça de fixação hidráulica ou um sistema de aperto de alta precisão.</li> <li>Compruebe la precisión de la fijación y la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarre de alta precisión.</li> </ul>
Drill Breakage Rotura da broca Rotura de broca	<ul style="list-style-type: none"> <li>Workpiece movement</li> <li>Movimento das peças de trabalho</li> <li>Movimiento de piezas de trabajo</li> </ul>	<ul style="list-style-type: none"> <li>Stabilize workpiece chucking and check stability of machine tool.</li> <li>Estabilize a fixação da peça de trabalho e veja a estabilidade da máquina ferramenta.</li> <li>Estabilice la fijación de la pieza de trabajo y compruebe la estabilidad de la máquina herramienta.</li> </ul>
	<ul style="list-style-type: none"> <li>Wrong drill</li> <li>Broca incorreta</li> <li>Broca incorrecta</li> </ul>	<ul style="list-style-type: none"> <li>Check drill type, drilling depth, cooling system, and workpiece material.</li> <li>Veja o tipo de broca, a profundidade do furo, o sistema de refrigeração e o material de trabalho.</li> <li>Compruebe el tipo de broca, la profundidad de taladrado, el sistema de refrigeración y el material de trabajo.</li> </ul>
	<ul style="list-style-type: none"> <li>Insufficient coolant</li> <li>Refrigeração insuficiente</li> <li>Refrigerante insuficiente</li> </ul>	<ul style="list-style-type: none"> <li>Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjusting positioning of coolant jet. Cool from both sides.</li> <li>Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados.</li> <li>Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfrie desde ambos lados.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Check cutting values, and possibly reduce feed.</li> <li>Comprove os valores de corte, aumente a velocidade de corte e reduza o avanço.</li> <li>Compruebe los valores de corte y a ser posible reduzca el avance.</li> </ul>
Splintering on the cutting corners Estilhamento das esquinas de corte Astillado en las esquinas de corte	<ul style="list-style-type: none"> <li>Workpiece movement</li> <li>Movimento das peças de trabalho</li> <li>Movimiento de piezas de trabajo</li> </ul>	<ul style="list-style-type: none"> <li>Stabilize workpiece chucking and check stability of machine tool.</li> <li>Estabilize a fixação da peça de trabalho e veja a estabilidade da máquina ferramenta.</li> <li>Estabilice la fijación de la pieza de trabajo y compruebe la estabilidad de la máquina herramienta.</li> </ul>
	<ul style="list-style-type: none"> <li>Wrong drill</li> <li>Broca incorreta</li> <li>Broca incorrecta</li> </ul>	<ul style="list-style-type: none"> <li>Check drill type, drilling depth, cooling system, and workpiece material. Possibly, use longer drill.</li> <li>Comprove o tipo de broca, a profundidade do furo, sistema de refrigeração e o material de trabalho. A ser possível utilize uma broca mais longa.</li> <li>Compruebe el tipo de broca, la profundidad de taladrado, sistema de refrigeración y material de trabajo. A ser posible, utilice una broca más larga.</li> </ul>
	<ul style="list-style-type: none"> <li>Insufficient coolant</li> <li>Refrigeração insuficiente</li> <li>Refrigerante insuficiente</li> </ul>	<ul style="list-style-type: none"> <li>Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjusting positioning of coolant jet. Cool from both sides.</li> <li>Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados.</li> <li>Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfrie desde ambos lados.</li> </ul>
	<ul style="list-style-type: none"> <li>Cutting conditions</li> <li>Condições de corte</li> <li>Condiciones de corte</li> </ul>	<ul style="list-style-type: none"> <li>Check cutting values, and possibly reduce feed.</li> <li>Comprove os valores de corte, aumente a velocidade de corte e reduza o avanço.</li> <li>Compruebe los valores de corte y a ser posible reduzca el avance.</li> </ul>

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DRILLING

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