

# i-DREAM DRILL INSERTS & HOLDERS

## i-DREAM DRILL EINSÄTZE UND HALTER

### - Features of i-Dream Drill Inserts- - Merkmale des i-Dream Drill Einsätze

- ▶ Secure and accurate seating resulting in accurate repeatability and concentricity.  
Der sichere und genaue Sitz der Platte garantiert genaue Wiederholbarkeit beim Einsatz und beim Rundlauf.

#### i-Dream Drill General / i-Dream Drill allgemeinen

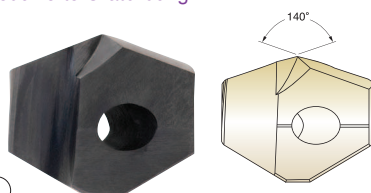
- ▶ For most steels materials / In den meisten Stahlsorten

#### i-Dream Drill INOX / i-Dream Drill INOX

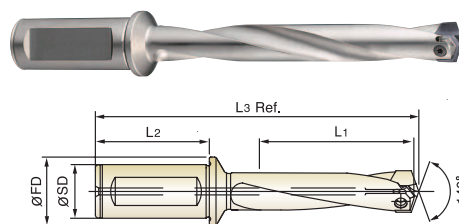
- ▶ For tough, ductile materials and stainless steels  
Für zähe, verformbare Werkstoffe und rostfreie Stähle.
- ▶ Light, sharp cutting edge / Scharfe Schneidkante
- ▶ Soft cutting action / Weicher Schnitt
- ▶ Minimize cutting forces / Minimaler Schneiddruck
- ▶ Reduce built-up edge / Reduzierte Gratbildung

### - Features of i-Dream Drill Holders- - Merkmale des i-Dream Drill Halters-

- ▶ Special Alloy Steels maintain its hardness and toughness under high temperatures.  
Speziell legierter Stahl, der seine Härte und Zähigkeit auch bei hohen Temperaturen behält.
- ▶ Innovative surface treatment improves wear resistance and reduces corrosion.  
Innovative Oberflächenbehandlung, die die Verschleissfestigkeit erhöht und die Korrosion vermindert.
- ▶ High Performance flute design allows maximum chip evacuation and minimum interference.  
Optimierte Nutenform für maximale Spanabfuhr.



cutting conditions : p.50~51



Series Range (mm)	Insert EDP No.		Insert O.D.			Holder EDP No.	Shank Dia. SD	Shank Length L2	Flange Dia. FD	Drilling Depth		Overall Length L3 Ref.	Screw No.					
	General (TiAlN)	INOX (TiCN)	h7							L1	L3 Ref.							
			dec.	frac.	mm													
A Ø12.00 to Ø13.99	YA1A1200	YA2C1200	0.4724		12.00	ZH12003020	20	50	25	3D	36	112.4						
	YA1A1210	YA2C1210	0.4764		12.10	ZH12005020				5D	60			136.4				
	YA1A1220	YA2C1220	0.4803		12.20	ZH12007020				7D	84							
	YA1A1230	YA2C1230	0.4844	31/64	12.30									160.4				
	YA1A1250	YA2C1250	0.4921		12.50													
	YA1A1260	YA2C1260	0.4961		12.60	ZH12503020								3D	37.5	113.4	TX1213T08	
	YA1A1270	YA2C1270	0.5000	1/2	12.70	ZH12505020				5D	62.5			5D	62.5			
	YA1A1280	YA2C1280	0.5039		12.80	ZH12507020				7D	87.5			7D	87.5	163.4		
	YA1A1290	YA2C1290	0.5079		12.90													
	YA1A1300	YA2C1300	0.5118		13.00	ZH13003020									3D	39	115.4	
	YA1A1310	YA2C1310	0.5156	33/64	13.10	ZH13005020				5D	65			5D	65			
	YA1A1320	YA2C1320	0.5197		13.20	ZH13007020				7D	91			7D	91	167.4		
	YA1A1349	YA2C1349	0.5312	17/32	13.49													
	YA1A1350	YA2C1350	0.5315		13.50												TX1314T08	
	YA1A1360	YA2C1360	0.5354		13.60	ZH13503020									3D	40.5		116.4
	YA1A1370	YA2C1370	0.5394		13.70	ZH13505020				20	50			25	5D	67.5	143.4	
	YA1A1380	YA2C1380	0.5433		13.80	ZH13507020				7D	94.5			7D	94.5	170.4		
	YA1A1389	YA2C1389	0.5469	35/64	13.89													
B Ø14.00 to Ø15.99	YB1A1400	YB2C1400	0.5512		14.00		20	50	25	3D	42	118.9	TX1415T08					
	YB1A1410	YB2C1410	0.5551		14.10	ZH14003020												
	YB1A1420	YB2C1420	0.5591		14.20	ZH14005020				5D	70			5D	70			
	YB1A1429	YB2C1429	0.5625	9/16	14.29	ZH14007020				7D	98			7D	98	174.9		
	YB1A1430	YB2C1430	0.5630		14.30													
	YB1A1440	YB2C1440	0.5669		14.40													

- ▶ TiN, TiCN, TiAlN & Hardslick are available on your request.
- ▶ 10×D Holder is available on your request.

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
		~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (~HB275~)	~HRc28 (~HB275)	HRc28~ (~HB275~)	~HRc37 (~HB350)	HRc37~ (~HB350~)	~HRc24 (~HB250)	HRc24~ (~HB250~)	~HRc13 (~HB200)	HRc13~ (~HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (~HB220~)	~HRc8 (~HB180)
Y # 1A	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Y # 2C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



**YB1A / YB2C**  
**YC1A / YC2C**

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**Merkmale des i-Dream Drill Einsätze**

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**i-Dream Drill General / i-Dream Drill allgemeinen**

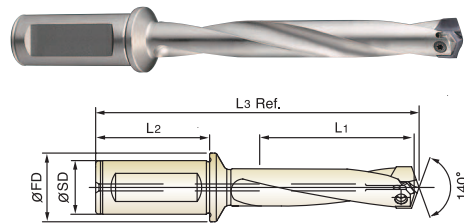
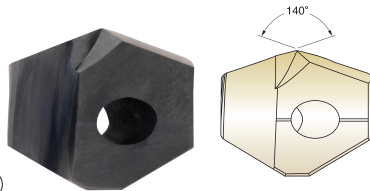
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**i-Dream Drill INOX / i-Dream Drill INOX**

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cutting conditions : p.50~51

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	General (TiAlN)	INOX (TiCN)	h7				SD	L2	FD	L1	L3 Ref.																
			dec.	frac.	mm																						
B Ø14.00 to Ø15.99	YB1A1450	YB2C1450	0.5709		14.50	ZH14503020 ZH14505020 ZH14507020	20	50	25	3D	43.5	120.9	TX1415T08														
	YB1A1460	YB2C1460	0.5748		14.60					5D	72.5	149.9															
	YB1A1468	YB2C1468	0.5781	37/64	14.68					7D	101.5	178.9															
	YB1A1480	YB2C1480	0.5827		14.80	ZH15003020 ZH15005020 ZH15007020	20	50	25	3D	45	122.9															
	YB1A1500	YB2C1500	0.5906		15.00					5D	75	152.9															
	YB1A1508	YB2C1508	0.5938	19/32	15.08					7D	105	182.9															
	YB1A1510	YB2C1510	0.5945		15.10					ZH15503020 ZH15505020 ZH15507020	20	50		25	3D	46.5	123.9										
	YB1A1520	YB2C1520	0.5984		15.20										5D	77.5	154.9										
	YB1A1530	YB2C1530	0.6024		15.30										7D	108.5	185.9										
	YB1A1530	YB2C1530	0.6024		15.30										ZH16003020 ZH16005020 ZH16007020	20	50	25	3D	48	125.0						
	YB1A1548	YB2C1548	0.6094	39/64	15.48														5D	80	157.0						
	YB1A1550	YB2C1550	0.6102		15.50														7D	112	189.0						
	YB1A1560	YB2C1560	0.6142		15.60														ZH16503020 ZH16505020 ZH16507020	20	50	25	3D	49.5	127.0		
	YB1A1570	YB2C1570	0.6181		15.70																		5D	82.5	160.0		
YB1A1580	YB2C1580	0.6220		15.80	7D								115.5										193.0				
YB1A1587	YB2C1587	0.6250	5/8	15.87	ZH16673020 ZH16675020 ZH16677020								20										50	25	3D	49.5	127.0
YC1A1600	YC2C1600	0.6299		16.00																					5D	82.5	160.0
YC1A1609	YC2C1609	0.6335		16.09		7D	115.5	193.0																			
YC1A1620	YC2C1620	0.6378		16.20		ZH16673020 ZH16675020 ZH16677020	20	50	25																3D	49.5	127.0
YC1A1627	YC2C1627	0.6406	41/64	16.27																					5D	82.5	160.0
YC1A1630	YC2C1630	0.6417		16.30						7D	115.5	193.0															
YC1A1650	YC2C1650	0.6496		16.50						ZH16673020 ZH16675020 ZH16677020	20	50		25											3D	49.5	127.0
YC1A1667	YC2C1667	0.6562	21/32	16.67																					5D	82.5	160.0
YC1A1680	YC2C1680	0.6614		16.80											7D	115.5	193.0										

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	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
		~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (~HB275~)	~HRc28 (~HB275)	HRc28~ (~HB275~)	~HRc37 (~HB350)	HRc37~ (~HB350~)	~HRc24 (~HB250)	HRc24~ (~HB250~)	~HRc13 (~HB200)	HRc13~ (~HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (~HB220~)	~HRc8 (~HB180)
Y * 1A	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Y * 2C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

- HSS
- i-DREAM DRILLS
- DREAM DRILLS -GENERAL
- DREAM DRILLS -INOX
- DREAM DRILLS -ALU
- DREAM DRILLS -CFRP
- DREAM DRILLS -MQL TYPE
- DREAM DRILLS for HARDENED STEELS
- GENERAL CARBIDE DRILLS
- NC-SPOTTING DRILLS
- CENTER DRILLS
- MULTI-1 DRILLS
- HPD DRILLS
- GOLD-P DRILLS
- STRAIGHT SHANK DRILLS
- TAPER SHANK DRILLS
- NC-SPOTTING DRILLS
- CENTER DRILLS
- SPADE DRILLS
- TECHNICAL DATA



**RECOMMENDED CUTTING CONDITIONS**  
**EMPFOHLENE SCHNEIDKONDITIONEN**

**METRIC**

Material Werkstück		Tensile Strength		Hardness		Cutting Speed Vc [M/min]	Feed [mm/rev]				
		[N/mm²]	HB	HRc	Ø12.0 ~Ø14.9		Ø15.0 ~Ø17.9	Ø18.0 ~Ø21.9	Ø22.0 ~Ø26.9	Ø27.0 ~Ø31.9	
Non-alloyed steels, Cast steels Free-machining steels	9SMn28, 9SMnPb28, 10SPb20 etc	~500	100-150			95~120	0.16-0.28	0.21~0.35	0.27~0.40	0.34~0.52	0.37~0.55
		500-850	150-250	~24		80~105	0.14-0.24	0.21~0.35	0.27~0.40	0.34~0.52	0.37~0.55
Low-alloyed steels, Cast steels(<5% ) Carbon steels	C15, C22, 20Mn5, Ck45, C45 etc	~450	85-125			90~115	0.14-0.25	0.20~0.33	0.25~0.39	0.31~0.47	0.34~0.50
		450-755	125-225	~19		70~90	0.12-0.20	0.17~0.28	0.22~0.32	0.30~0.46	0.33~0.49
Alloyed steels	45CrMo4, 42CrMo4, 16MnCr5, Ck75, 35CrMo4, 16MnCr5 etc	755-900	225-265	19-27		60~80	0.12-0.20	0.17~0.28	0.22~0.32	0.30~0.46	0.33~0.49
		900-1200	265-350	27~37		55~70	0.10-0.16	0.15~0.25	0.21~0.30	0.25~0.38	0.29~0.43
		~600	125-175	~7		80~100	0.14-0.24	0.17~0.28	0.22~0.32	0.30~0.46	0.34~0.50
		600-800	175-235	7~22		70~90	0.12-0.20	0.17~0.28	0.22~0.32	0.30~0.46	0.34~0.50
High-alloyed steels	36CrNiMo4, 41CrAlMo7 etc	800-950	235-280	22~29		60~80	0.12-0.20	0.15~0.25	0.22~0.32	0.30~0.46	0.34~0.50
		950-1110	280-330	29~35		55~70	0.10-0.16	0.13~0.21	0.21~0.30	0.25~0.38	0.29~0.43
		1110-1230	330-360	35~39		45~60	0.08-0.12	0.13~0.21	0.21~0.30	0.25~0.38	0.29~0.43
		600-1020	225-300	19~32		45~60	0.12-0.20	0.15~0.25	0.21~0.30	0.20~0.31	0.24~0.35
Structural steels	St33, St37-2, St44-2, St52, St60 etc	1020-1200	300-355	32~38		40~55	0.10-0.16	0.11~0.18	0.21~0.30	0.20~0.31	0.24~0.35
		1200-1330	355-390	38~42		40~50	0.08-0.12	0.09~0.14	0.18~0.26	0.19~0.29	0.23~0.34
		350-500	100-150			75~95	0.14-0.24	0.21~0.35	0.27~0.39	0.29~0.44	0.32~0.47
Tool steels	102Cr6, 105WCr6, C75W etc	500-850	150-250	~24		60~75	0.12-0.20	0.20~0.33	0.22~0.32	0.25~0.38	0.29~0.43
		850-1200	250-355	24~38		50~65	0.10-0.16	0.17~0.28	0.21~0.30	0.21~0.32	0.26~0.38
Grey cast iron	Pearlitic, Ferritic Pearlitic	500-705	150-210	~16		50~65	0.10-0.16	0.13~0.21	0.18~0.26	0.20~0.31	0.24~0.35
		705-950	210-280	16~29		40~50	0.10-0.16	0.13~0.21	0.18~0.26	0.20~0.31	0.24~0.35
Cast iron nodular	Ferritic Pearlitic	500-700	150-210	~16		100~125	0.15-0.26	0.20~0.37	0.27~0.42	0.36~0.51	0.40~0.55
		700-850	210-250	16~24		75~95	0.11~0.20	0.16~0.29	0.20~0.30	0.25~0.35	0.29~0.40
Malleable cast iron	Ferritic Pearlitic	540	165	4		95~120	0.13-0.22	0.17~0.31	0.21~0.32	0.28~0.40	0.32~0.44
		850	250	24		75~95	0.11~0.20	0.14~0.26	0.19~0.29	0.25~0.35	0.29~0.40
Aluminum alloys (Wrought)	not heat treatable hardened	450	125			100~125	0.13-0.22	0.17~0.31	0.21~0.32	0.28~0.40	0.32~0.44
		780	230	21		75~95	0.11~0.18	0.14~0.26	0.19~0.29	0.25~0.35	0.29~0.40
Aluminum alloys (Cast)	≤12% Si, not heat treatable ≤12% Si, hardened >12% Si, not heat treatable	350-500	65			250~330	0.30-0.40	0.35~0.45	0.40~0.50	0.45~0.55	0.50~0.60
			150			200~250	0.30-0.40	0.35~0.45	0.40~0.50	0.45~0.55	0.50~0.60
			75			200~50	0.25-0.35	0.30~0.40	0.35~0.45	0.40~0.50	0.45~0.55
Copper alloys	Free machining(Pb>1%) Brass Electrolytic copper	90				150~220	0.25-0.35	0.30~0.40	0.35~0.45	0.40~0.50	0.45~0.55
		130				100~200	0.20-0.30	0.25~0.35	0.30~0.40	0.35~0.45	0.40~0.50
Non ferrous material	Duroplastics Fiber plastics Hard rubber	110				115~145	0.16-0.28	0.23~0.36	0.29~0.36	0.37~0.45	0.41~0.48
		90				145~185	0.17~0.29	0.24~0.37	0.30~0.38	0.38~0.46	0.42~0.49
Stainless steels	Austenitic and Austenitic/ferritic	100				95~120	0.06-0.09	0.09~0.13	0.11~0.13	0.15~0.18	0.19~0.22
		Y□1A / Y□2C	450-610	135-185	~9		45~60	0.10-0.16	0.12~0.18	0.14~0.20	0.15~0.26
		610-930	185-275	9~28		30~45	0.08-0.14	0.09~0.15	0.10~0.16	0.12~0.20	0.14~0.22

\*Formulas :

RPM = revolution per minute (rev/min)  
M/min = surface meter per minute(M/min)  
DIA. = diameter of drill (mm)  
mm/rev = feed rate(mm/rev)

$$M/min = \frac{(RPM) \cdot \pi \cdot (DIA.)}{1000}$$

$$mm/min = (RPM) \cdot (mm/rev)$$

$$RPM = \frac{(M/min) \cdot 1000}{(\pi) \cdot (DIA.)}$$

- The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.  
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
- Recommend you to reduce the feed rate to 85%,70% when you use 5xD,7xD holders.
- For use of 7xD holder, we recommend to drill a centering pre-hole with equal to or larger than 140 ° point angle to min. 2/3 cutting diameter.  
The use of the centering pre-hole improves hole location , roundness and surface finish.

**INCH**

Material Werkstück		Tensile Strength	Hardness		Cutting Speed	Feed [IPR]				
		MPa	HB	HRC	Vc [SFM]	Ø31/64 ~Ø37/64	Ø19/32 ~Ø45/64	Ø23/32 ~Ø55/64	Ø7/8 ~Ø1-1/16	Ø1-3/32 ~Ø1-1/4
Non-alloyed steels, Cast steels Free-machining steels	9SMn28, 9SMnPb28, 10SPb20 etc	~500	100~150		312~394	0.006~0.011	0.008~0.014	0.011~0.016	0.013~0.020	0.015~0.022
		500~850	150~250	~24	262~344	0.006~0.009	0.008~0.014	0.011~0.016	0.013~0.020	0.015~0.022
Low-alloyed steels, Cast steels(<5% ) Carbon steels	C15, C22, 20Mn5, Ck45, C45 etc	~450	85~125		295~377	0.006~0.010	0.008~0.013	0.010~0.015	0.012~0.019	0.013~0.020
		450~755	125~225	~19	230~295	0.005~0.008	0.007~0.011	0.009~0.013	0.012~0.018	0.013~0.019
		755~900	225~265	19~27	197~262	0.005~0.008	0.007~0.011	0.009~0.013	0.012~0.018	0.013~0.019
Alloyed steels	45CrMo4, 42CrMo4, 16MnCr5, Ck75, 35CrMo4, 16MnCr5 etc	900~1200	265~350	27~37	180~230	0.004~0.006	0.006~0.010	0.008~0.012	0.010~0.015	0.011~0.017
		~600	125~175	~7	262~328	0.006~0.009	0.007~0.011	0.009~0.013	0.012~0.018	0.013~0.020
		600~800	175~235	7~22	230~295	0.005~0.008	0.007~0.011	0.009~0.013	0.012~0.018	0.013~0.020
		800~950	235~280	22~29	197~262	0.005~0.008	0.006~0.010	0.009~0.013	0.012~0.018	0.013~0.020
High-alloyed steels	36CrNiMo4, 41CrAlMo7 etc	950~1110	280~330	29~35	180~230	0.004~0.006	0.005~0.008	0.008~0.012	0.010~0.015	0.011~0.017
		600~1020	225~300	19~32	148~197	0.005~0.008	0.006~0.010	0.008~0.012	0.008~0.012	0.009~0.014
		1020~1200	300~355	32~38	131~180	0.004~0.006	0.004~0.007	0.008~0.012	0.008~0.012	0.009~0.014
Structural steels	St33, St37-2, St44-2, St52, St60 etc	1200~1330	355~390	38~42	131~164	0.003~0.005	0.004~0.006	0.007~0.010	0.007~0.011	0.009~0.013
		350~500	100~150		246~312	0.006~0.009	0.008~0.014	0.011~0.015	0.011~0.017	0.013~0.019
		500~850	150~250	~24	197~246	0.005~0.008	0.008~0.013	0.009~0.013	0.010~0.015	0.011~0.017
Tool steels	102Cr6, 105WCr6, C75W etc	850~1200	250~355	24~38	164~213	0.004~0.006	0.007~0.011	0.008~0.012	0.008~0.013	0.010~0.015
		500~705	150~210	~16	164~213	0.004~0.006	0.005~0.008	0.007~0.010	0.008~0.012	0.009~0.014
Grey cast iron	Pearlitic, Ferritic Pearlitic	705~950	210~280	16~29	131~164	0.004~0.006	0.005~0.008	0.007~0.010	0.008~0.012	0.009~0.014
		500~700	150~210	~16	328~410	0.006~0.010	0.008~0.015	0.011~0.017	0.014~0.020	0.016~0.022
Cast iron nodular	Ferritic Pearlitic	700~850	210~250	16~24	246~312	0.004~0.008	0.006~0.011	0.008~0.012	0.010~0.014	0.011~0.016
		540	165	4	312~394	0.005~0.009	0.007~0.012	0.008~0.013	0.011~0.016	0.013~0.017
Malleable cast iron	Ferritic Pearlitic	850	250	24	246~312	0.004~0.008	0.006~0.010	0.007~0.011	0.010~0.014	0.011~0.016
		450	125		328~410	0.005~0.009	0.007~0.012	0.008~0.013	0.011~0.016	0.013~0.017
Aluminum alloys (Wrought)	not heat treatable hardened	450	230	21	246~312	0.004~0.007	0.006~0.010	0.007~0.011	0.010~0.014	0.011~0.016
			65		820~1083	0.0118~0.0157	0.0138~0.0177	0.0157~0.0197	0.0177~0.0217	0.0197~0.0236
Aluminum alloys (Cast)	≤12% Si, not heat treatable ≤12% Si, hardened >12% Si, not heat treatable		75		656~820	0.0118~0.0157	0.0138~0.0177	0.0157~0.0197	0.0177~0.0217	0.0197~0.0236
			90		492~722	0.0098~0.0138	0.0118~0.0157	0.0138~0.0177	0.0157~0.0197	0.0177~0.0217
			130		328~656	0.0079~0.0118	0.0098~0.0138	0.0118~0.0157	0.0138~0.0177	0.0157~0.0197
Copper alloys	Free machining(Pb>1%) Brass Electrolytic copper		110		377~476	0.006~0.011	0.009~0.014	0.011~0.014	0.015~0.018	0.016~0.019
			90		476~607	0.007~0.011	0.009~0.015	0.012~0.015	0.015~0.018	0.017~0.019
			100		312~394	0.002~0.004	0.004~0.005	0.004~0.005	0.006~0.007	0.007~0.009
Non ferrous material	Duroplastics Fiber plastics Hard rubber									
Stainless steels	Austenitic and Austenitic/ferritic	450~610	135~185	~9	145~197	0.004~0.006	0.005~0.007	0.006~0.008	0.006~0.011	0.007~0.011
		610~930	185~275	9~28	89~145	0.003~0.005	0.004~0.006	0.004~0.006	0.005~0.008	0.006~0.009

Y1A / Y2C

Y2C

\*Formulas :

$$SFM = \frac{(RPM) \cdot \pi \cdot (DIA.)}{12}$$

$$IPM = (RPM) \cdot (IPR)$$

$$RPM = \frac{(SFM) \cdot 12}{(\pi) \cdot (DIA.)}$$

- RPM = revolution per minute (rev/min)
- SFM = surface feet per minute (ft/min)
- DIA. = diameter of drill (inch)
- IPR = feed rate (inch/rev)
- IPM = inch per minute penetration rate

- ▶ The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.  
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
- ▶ Recommend you to reduce the feed rate to 85%,70% when you use 5xD,7xD holders.
- ▶ For use of 7xD holder, we recommend to drill a centering pre-hole with equal to or larger than 140 ° point angle to min. 2/3 cutting diameter.  
The use of the centering pre-hole improves hole location, roundness and surface finish.

i-DREAM  
DRILLS

DREAM  
DRILLS  
-GENERAL

DREAM  
DRILLS  
-INOX

DREAM  
DRILLS  
-ALU

DREAM  
DRILLS  
-CFRP

DREAM  
DRILLS  
-MQL TYPE

DREAM  
DRILLS  
for HARDENED  
STEELS

GENERAL  
CARBIDE  
DRILLS

NC-SPOTTING  
DRILLS

CENTER  
DRILLS

MULTI-1  
DRILLS

HPD DRILLS

GOLD-P  
DRILLS

STRAIGHT  
SHANK  
DRILLS

TAPER  
SHANK  
DRILLS

NC-SPOTTING  
DRILLS

CENTER  
DRILLS

SPADE  
DRILLS

TECHNICAL  
DATA