

G-LIST No. | DW1010

非铁合金加工用硬质合金中等刃型

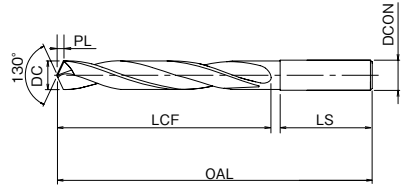
CARBIDE MEDIUM FOR NON-FERROUS METAL

NF-GDN

切削条件 Cutting Conditions | P.396

在汽车，航空行业中较多出现的铸铝、铝合金、变形铝的高速加工中，可以实现较好的性价比。

Will provides high cost performances on Aluminum Die-casting, Extruded Aluminum, Casted Aluminum which are commonly used for Automotive, Aerospace Industries.



CARBIDE **0~-0.01** **20°** **SHRINK FIT**

单位:mm Unit:mm

商品号 EDP NO.	直径 DC	槽长 LCF	全长 OAL	柄径 DCON	柄长 LS	先端 PL	库存 Stock	重量 (g)
8587300	3	25	59	3	32	0.7		7
8587310	3.1	27			36	0.7		9
8587320	3.2				36	0.8	10	
8587330	3.3	30	65	4	33	0.8		10
8587340	3.4				33	0.8	10	
8587350	3.5	33	73	5	33	0.8		10
8587360	3.6				33	0.9	10	
8587366	3.66	36	83	6	33	0.9		10
8587368	3.68				33	0.9	10	
8587370	3.7	39	91	7	33	0.9		10
8587380	3.8				30	0.9	10	
8587390	3.9	43	101	8	30	0.9		10
8587400	4				30	0.9	10	
8587410	4.1	47	111	9	38	1		17
8587420	4.2				38	1	17	
8587430	4.3	52	121	10	35	1		16
8587440	4.4				35	1	16	
8587450	4.5	56	131	11	35	1		17
8587460	4.6				35	1.1	17	
8587462	4.62	60	141	12	35	1.1		17
8587464	4.64				35	1.1	17	
8587470	4.7	65	151	13	35	1.1		17
8587480	4.8				32	1.1	17	
8587490	4.9	70	161	14	32	1.1		17
8587500	5				32	1.2	17	
8587510	5.1	75	171	15	42	1.2		26
8587520	5.2				42	1.2	26	
8587530	5.3	80	181	16	42	1.2		27
8587540	5.4				38	1.3	27	
8587550	5.5	85	191	17	38	1.3		27
8587552	5.52				38	1.3	27	
8587554	5.54	38	1.3	27				

商品号 EDP NO.	直径 DC	槽长 LCF	全长 OAL	柄径 DCON	柄长 LS	先端 PL	库存 Stock	重量 (g)
8587560	5.6	43	83	6	38	1.3		27
8587570	5.7				38	1.3	27	
8587580	5.8	47	90	7	38	1.4		27
8587590	5.9				38	1.4	27	
8587600	6	52	97	8	38	1.4		28
8587610	6.1				41	1.4	36	
8587620	6.2	56	104	9	41	1.4		36
8587630	6.3				41	1.5	36	
8587640	6.4	60	111	10	41	1.5		36
8587650	6.5				41	1.5	38	
8587660	6.6	65	118	11	41	1.5		38
8587670	6.7				41	1.6	38	
8587680	6.8	70	125	12	36	1.6		38
8587690	6.9				36	1.6	38	
8587700	7	75	132	13	36	1.6		38
8587710	7.1				42	1.7	49	
8587720	7.2	80	139	14	42	1.7		49
8587730	7.3				42	1.7	54	
8587736	7.36	85	146	15	42	1.7		50
8587738	7.38				42	1.7	50	
8587740	7.4	90	153	16	42	1.7		50
8587750	7.5				42	1.7	51	
8587752	7.52	95	160	17	38	1.8		52
8587754	7.54				38	1.8	53	
8587760	7.6	100	167	18	38	1.8		50
8587770	7.7				38	1.8	51	
8587780	7.8	105	174	19	38	1.8		51
8587790	7.9				38	1.8	51	
8587800	8	110	181	20	38	1.9		51
8587810	8.1				43	1.9	66	
8587820	8.2	115	188	21	43	1.9		66
8587830	8.3				43	1.9	70	

直径 DC **8.4 ~ 10.9** 下一页 NEXT

●=标准库存品 ●=Standard stock item. □=特定代理店库存品 □=Stocked by specific distributors. Contact us for price & availability.

加工材料 Work Material	低碳素钢 软钢	中碳素钢	高碳素钢	合金钢	调质钢	淬火钢				不锈钢	工具钢	铸铁	球墨 铸铁	铜合金	变形铝	铸造 铝合金	钛合金	镍基合金	复合材料 CFRP	镁合金	金属基 复合材料 (MMC)
	Low Carbon Steel Mild Steel	Medium Carbon Steel	High Carbon Steel	Alloy Steel	Hardened Steel	Quenched and Tempered Steel				Stainless Steel	Tool Steel	Cast Iron	Ductile Cast Iron	Copper Alloy	Aluminum	Aluminum Alloy Casting	Titanium Alloy	Inconel	Composite Material	Magnesium Alloy	Metal Matrix Composites
商品记号 Abbreviation	C~0.25%	0.25~0.4%	0.45%~	SCM	~35 HRC	35~45 HRC	45~50 HRC	50~62 HRC	62~70 HRC	SUS	SKD SKS	FC	FCD	Cu	AL	AC			CFRP	AZ91D	
NF-GDN																					

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FROM	直径 DC	3 ~ 8.3						
商品号 EDP NO.	直径 DC	槽长 LCF	全长 OAL	柄径 DCON	柄长 LS	先端 PL	库存 Stock	重量 (g)
8587840	8.4	56			43	2		67
8587850	8.5							68
8587860	8.6	101		9	38	2		66
8587870	8.7							67
8587880	8.8	109		10	38	2.1		67
8587890	8.9							67
8587900	9	61			46	2.1		68
8587910	9.1							86
8587920	9.2	109		10	46	2.1		87
8587924	9.24							93
8587926	9.26	71			46	2.2		93
8587930	9.3							88
8587936	9.36	65			46	2.2		94
8587938	9.38							88
8587940	9.4	115		11	46	2.2		88
8587950	9.5							89

商品号 EDP NO.	直径 DC	槽长 LCF	全长 OAL	柄径 DCON	柄长 LS	先端 PL	库存 Stock	重量 (g)
8587952	9.52	65	109	10	42	2.2		94
8587954	9.54							92
8587960	9.6	71			42	2.2		86
8587970	9.7							87
8587980	9.8	115		11	42	2.3		87
8587990	9.9							88
8588000	10	65			42	2.3		89
8588010	10.1							109
8588020	10.2	115		11	48	2.4		110
8588030	10.3							110
8588040	10.4	71			48	2.4		111
8588050	10.5							112
8588060	10.6	115		11	48	2.5		113
8588070	10.7							109
8588080	10.8	65			42	2.5		110
8588090	10.9							117

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■记号说明请参考P1页。 See p.1 for explanation of icons.

非铁合金加工用硬质合金中等刃型

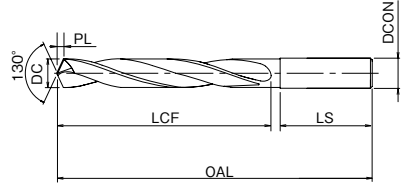
CARBIDE MEDIUM FOR NON-FERROUS METAL

NF-GDN

切削条件 Cutting Conditions | P.396

在汽车，航空行业中较多出现的铸铝、铝合金、变形铝的高速加工中，可以实现较好的性价比。

Will provides high cost performances on Aluminum Die-casting, Extruded Aluminum, Casted Aluminum which are commonly used for Automotive, Aerospace Industries.



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FROM 直径 DC 8.4 ~ 10.9

单位:mm Unit:mm

商品号 EDP NO.	直径 DC	槽长 LCF	全长 OAL	柄径 DCON	柄长 LS	先端 PL	库存 Stock	重量 (g)	
8588100	11	71	126	12	115	11	42	2.6	112
8588110	11.1				53	2.6	144		
8588120	11.2				53	2.6	145		
8588122	11.22				53	2.6	152		
8588124	11.24				53	2.6	152		
8588130	11.3				53	2.6	146		
8588136	11.36				53	2.6	153		
8588138	11.38				53	2.7	154		
8588140	11.4				53	2.7	147		
8588150	11.5				53	2.7	149		
8588160	11.6	53	2.7	149					
8588170	11.7	53	2.7	150					
8588180	11.8	53	2.8	152					

商品号 EDP NO.	直径 DC	槽长 LCF	全长 OAL	柄径 DCON	柄长 LS	先端 PL	库存 Stock	重量 (g)
8588190	11.9	76	126	12	48	2.8	152	
8588200	12				48	2.8	155	
8588210	12.1	76	128	12	50	2.8	155	
8588220	12.2				50	2.8	155	
8588230	12.3				50	2.9	156	
8588240	12.4				50	2.9	157	
8588250	12.5				50	2.9	158	
8588260	12.6				50	2.9	158	
8588270	12.7				50	3	162	
8588280	12.8				50	3	163	
8588290	12.9				50	3	169	
8588300	13				50	3	163	

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EX-黄金钻头

TDXL DRILLS
TDXL 钻头

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CHAMFERING
倒角

FLAT DRILLS/COUNTERBORING
平头钻/沉孔

CARBIDE REAMER
硬质合金铰刀

加工材料 Work Material	低碳素钢	中碳素钢	高碳素钢	合金钢	调质钢	淬火钢	不锈钢	工具钢	铸铁	球墨铸铁	铜合金	变形铝	铸造铝合金	钛合金	镍基合金	复合材料 CFRP	镁合金	金属基复合材料 (MMC)	
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NF-GDN																			

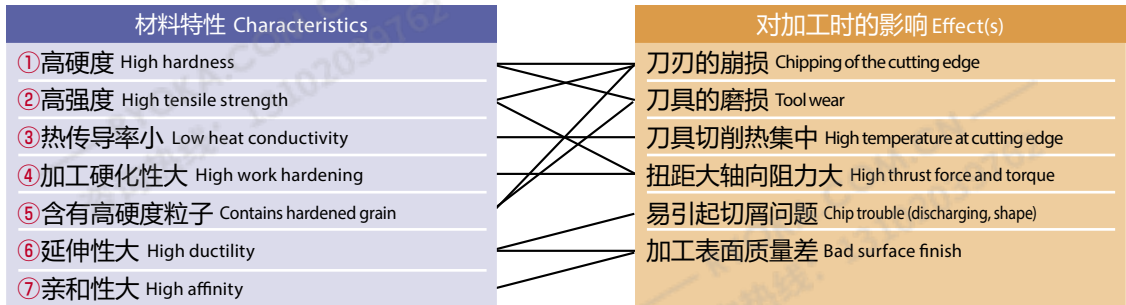
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难切削材料的钻孔 DRILLING DIFFICULT TO MACHINE MATERIALS

所谓难切削材料就如下所示具有不同种材料特性所组合，为此加工难度非常高，切削材料上钻孔，不仅要把握其特性，选择适当的工具，还需参考下面的注意事项，寻找出合适的切削条件。

Certain materials have special characteristics (listed below), that make drilling difficult. In order to successfully drill these materials, it is critical to use proper cutting conditions based on information about the material and the tool, and to understand how variations of these characteristics can influence the final outcome.

■难切削材料的特性 Characteristics of Difficult to Machine Materials



■具有代表性的难切削材料的加工注意事项 Machining Recommendations for Difficult to Machine Materials

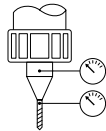
加工材料 Work Material	材料特性 Characteristics	加工建议 Machining Recommendations	推荐钻头 Recommended drills
奥氏体系不锈钢 Austenitic Stainless Steel SUS304, SUS316	<ul style="list-style-type: none"> ●加工硬质大 ●高温强度大 ●热传导率小 ●易延展，易生成刀瘤 ● High work hardening ● High tensile strength at high temperatures ● Low heat conductivity ● High ductility. Easy to get build up at the edge. => chipping 	<ul style="list-style-type: none"> ●应选用高韧性的工具及切削刃锋利的涂层工具。 ●加快进给速度 ●加中切削油 ● Use tough drill material with sharp cutting edge and coating ● High feed rate ● High coolant supply 	ADO-3D ADO-5D EX-SUS-GDS EX-SUS-GDR VP-HO-GDS EX-HO-GDR NEXUS-GDS NEXUS-GDR EX-SUS-GDN MT-SUS-GDR VP-HO-GDR
模具钢 Die Steel SKD11	<ul style="list-style-type: none"> ●含有大而硬的碳化物 ● Made of hard carbide grain (under 0.4%C => carbide grain is melted) 	<ul style="list-style-type: none"> ●应选用高刚性高速工具 ●降低转速，加快进给速度 ● Use high rigid HSS coated tools ● Use lower cutting speed and higher feed rate 	AD-2D AD-4D EX-GDS EX-GDN ADO-3D ADO-5D VPH-GDS EX-GDR
高锰钢 High Manganese Steel SCMnH	<ul style="list-style-type: none"> ●强度高，韧强大 ●加工硬化性大 ● High tensile strength and high toughness ● High work hardening 	<ul style="list-style-type: none"> ●提高工具和机械的刚性，固定夹具 ● Use rigid tools, machine and work clamping device 	AD-2D AD-4D VP-HO-GDS EX-GDS VPH-GDS
钛合金 Titanium Alloy Ti-6Al-4V	<ul style="list-style-type: none"> ●强度高 ●热传导率小 ●与工具的化学亲和力高 ● High tensile strength per Lower case ● Low heat conductivity ● Chemically active High affinity with tools 	<ul style="list-style-type: none"> ●充分冷却，控制发热 ● Use sufficient coolant and low cutting speed to maintain low cutting temperature. 	VP-HO-GDS EX-SUS-GDS EX-GDR ADO-3D ADO-5D VP-HO-GDR EX-HO-GDR
耐热合金 Heat Resistant Alloy Inconel, Hastelloy	<ul style="list-style-type: none"> ●高硬度 ●韧性大，加工硬化大 ● High hardness ● High work hardening Tough Difficult to machine 	<ul style="list-style-type: none"> ●提高工具和机械的刚性 ●使用有刚性的短刃涂层工具 ● Improve rigidity of tools and machines ● Use an Stub Drill with coating and rigidity 	FT-GDS VPH-GDS ADO-3D ADO-5D FT-GDN EX-GDS
高硬度淬火钢 High Hardened Quenched and Tempered Steels	<ul style="list-style-type: none"> ●高硬度剪应力高，抗切削性大 ● High hardness High shearing stress High cutting resistance 	<ul style="list-style-type: none"> ●请选用高硬度的工具和高刚性的工具 ● Use a drill made from high hardened and rigid material if the work material is over 45 HRC, use a carbide drill. 	FHL-GDTS AD-2D AD-4D FH-GDN VPH-GDS FTO-M-GDXL FTO-H-GDXL
高硅铝合金 High Silicon Aluminum Alloy AC9A, A390	<ul style="list-style-type: none"> ●含有高硬度粒子，易引起强烈工具磨损 ● High hardened grain causes large wear on tools 	<ul style="list-style-type: none"> ●请选用高硬度的工具 ●供足切削油 ● Use a drill made from high hardened material ● Provide sufficient coolant supply 	D-GDN NF-GDN
铁镍钴合金 Kovar Fe-Ni-Co 合金	<ul style="list-style-type: none"> ●低热膨胀材料 ●凝着力高易加工 ● Low thermal Expansion material ● Tend to Build-up, but easy to machine 	<ul style="list-style-type: none"> ●请选用大螺旋角切削刃锋利的钻头 ● Use high helix and sharp edge drill 	WX-MS-GDS EX-SUS-GDS EX-SUS-GDR EX-SUS-GDN NEXUS-GDS NEXUS-GDR
钴铬合金 Co-Cr Alloy	<ul style="list-style-type: none"> ●耐腐蚀，韧性好 ●和谐性好 ● Better anti-rust, Better rigidity ● Harmonize with organism 	<ul style="list-style-type: none"> ●使用切屑分断性好，耐磨损的钻头 ● Easy to break chips, but recommended to use better drill on wear resistance 	FT-GDN ADO-3D ADO-5D
复合材料 Composite CFRP GFRP	<ul style="list-style-type: none"> ●内部的硬纤维物质导致强烈磨损 ●易产生细毛和剥离 ● Tough fiber causes exframe wear ● Tend to have naps and peel off 	<ul style="list-style-type: none"> ●请使用锋利且耐磨损的工具 ●防止产生毛刺及毛刺剥离的设计要求 ● Use sharp and wear resistant tools ● Design the tool to prevent naps and peeling 	D-STAD PCD-CF-GDN

硬质合金钻头切削条件基准表 CARBIDE DRILLS CUTTING CONDITIONS

NF-GDN

加工材料 Work Material	铸造铝合金 Aluminum Alloy Casting ~13wt%Si·AC1~8·ADC		铝延展材 Aluminum A7075·A2024·A5052		铜合金 Copper Alloy C1020·C6140		镁合金 Magnesium Alloy AZ91D·AZ80A		铸铁 Cast Iron FC250~350N/mm ²	
切削速度 Cutting Speed	80~200m/min		80~200m/min		40~100m/min		63~100m/min		63~100m/min	
直径 Drill Dia. (mm)	转速 Speed (min ⁻¹)	进给量 Feed Rate (mm/rev)	转速 Speed (min ⁻¹)	进给量 Feed Rate (mm/rev)	转速 Speed (min ⁻¹)	进给量 Feed Rate (mm/rev)	转速 Speed (min ⁻¹)	进给量 Feed Rate (mm/rev)	转速 Speed (min ⁻¹)	进给量 Feed Rate (mm/rev)
3	9,600	0.09~0.3	9,600	0.09~0.18	7,400	0.02~0.03	8,500	0.09~0.18	7,400	0.05~0.08
4	7,600	0.12~0.4	7,600	0.12~0.24	5,600	0.02~0.04	6,400	0.12~0.24	5,600	0.06~0.1
5	6,400	0.15~0.5	6,400	0.15~0.3	4,500	0.03~0.05	5,100	0.15~0.3	5,100	0.08~0.13
6	5,600	0.18~0.6	5,600	0.18~0.36	3,700	0.03~0.06	4,200	0.18~0.36	4,200	0.09~0.15
8	4,400	0.24~0.8	4,400	0.24~0.48	2,800	0.04~0.08	3,200	0.24~0.48	3,200	0.12~0.2
10	3,800	0.3~1	3,800	0.30~0.6	2,200	0.05~0.1	2,500	0.30~0.6	2,500	0.15~0.25
12	3,500	0.36~1.2	3,500	0.36~0.72	1,900	0.06~0.12	2,100	0.36~0.72	2,300	0.18~0.3
13	3,300	0.39~1.3	3,300	0.39~0.78	1,700	0.07~0.13	2,000	0.39~0.78	2,100	0.20~0.33

1. 此切削条件基准表适用于使用水溶性切削油剂的情况。
2. 请使用稀释倍率20倍~30倍的优质水溶性切削油剂。
3. 上述条件适用于孔深为3D以下的情况。若孔深超过3D时，请按照右图调整切削速度。
4. 当切削材质不易分断时，请适当采用台阶式加工。
5. 请使用无伤痕，不脏的弹簧夹头，并将钻头的径向跳动控制在0.01mm以下。



D: drill dia

孔深 (D为直径) Depth of Cut	4D以下 ≤4D	5D以下 ≤5D
切削速度抑制系数 Coefficient for reducing speed	×0.8	×0.7

加工镁合金时：

1. 请在与切削油剂制造商商谈之后，务必使用镁专用油剂。
2. 请注意切屑的处理和管理。

When a drill is used in Magnesium alloy...

1. Please use cutting fluid for Magnesium and check with a cutting fluid producer.
2. Please be careful of control and disposition of chips.

●半干式(雾式)加工时的注意事项

1. 喷雾量以50CC/n以上为宜，推荐下表面追加涂层。
2. 当切削材质不易分断时，请适当采用台阶式加工。

About semi-dry (mist) processing

1. To use a minimum mist discharge rate of 50cc/h, the addition of the coating in the table below is recommended.
2. Operate the drill in steps as necessary when working on a material that disintegrates chips poorly.

D: 钻头直径 D: drill dia

加工材料 Work Material	切削速度 Cutting Speed (m/min)	每转的进给量 Feed Rate (mm/rev)	推荐涂层 Recommended Coating
铸造铝合金 Aluminum Alloy Casting	40~60	3% × D ~ 4% × D	DLC涂层 DLC coating
铝延展材 Aluminum	40~60	3% × D ~ 4% × D	DLC涂层 DLC coating
铸铁 Cast Iron	40~60	3% × D ~ 4% × D	FX(TiAlN)涂层 FX(TiAlN) coating