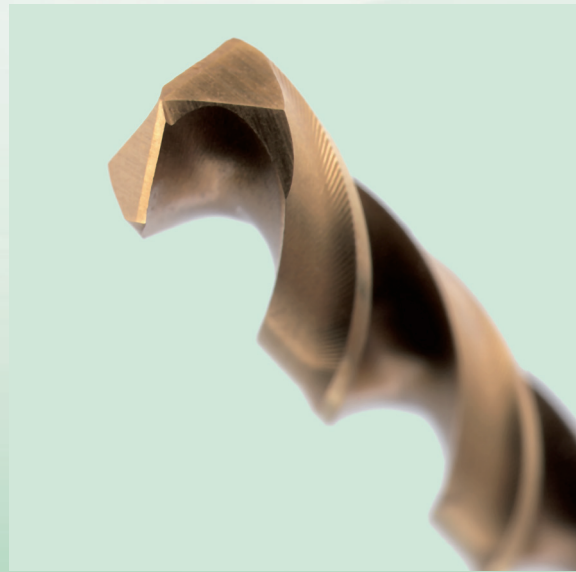


HARTNER

Precision Cutting Tools

FU500 | FN500

UNIVERSEL & ECONOMIQUE



























	16MnCr5
	11SMn30+C
	St 37
	GG
	GGG
	C45
	VA
	Aluminium
	Cuivre
	Bronze
	Laiton
	Plexiglas
	PVC
	PE 1000
	Makrolon

Code ISO

P	Aciers communs, aciers hautement alliés
M	Aciers inoxydables
K	Fontes grises, fontes à graphite sphéroïdal et fontes malléables
N	Aluminium et ses alliages ainsi que d'autres métaux non ferreux
S	Alliages de titane, spéciaux et superalliages
H	Aciers trempés et fontes dures

Pictogrammes

Matériaux de coupe	 
	Aciers rapides
Version	  
	poli FIRE TiN
Type	   
Profondeur	  
Norme	  
	 selon standard Hartner
Angle d'affûtage	 
Ø-Tolérance	
Sens de coupe	
	à droite
Forme de la queue	 
	selon DIN 6535 cylindrique
Lubrification interne	 
	avec LI sans LI

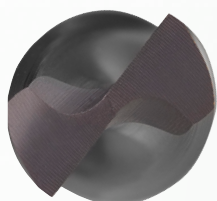
FORETS HELICOÏDAUX HAUTE PERFORMANCE HSCO ET HSS-E-PM :



FU 500

Un outil universel pour les perçages extrêmement précis

page 4



FN 500

Un outil efficient pour l'usinage des aciers et matériaux hautement alliés et hautement résistants

page 6



**UNIVERSEL ET
HAUTEMENT EFFICIENT**

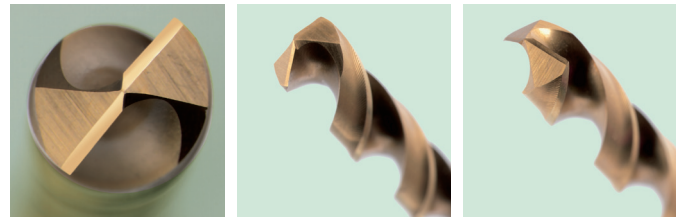
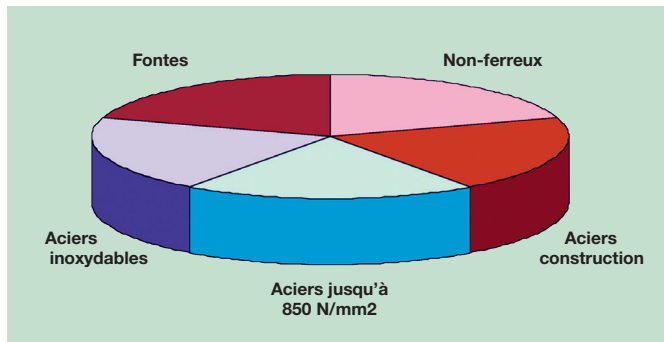
FU 500

FU 500 – le nouvel universel de Hartner!

Effectivement, là où jusqu'à présent il était nécessaire d'utiliser des forets de différentes géométries, vous allez pouvoir choisir ce foret hélicoïdal FU 500 universel et façonner votre produit avec des résultats très performants. Avec ce FU 500 vous percerez aussi bien les non-ferreux, les aciers de construction, les aciers au carbone, les aciers hautement alliés, aciers à outils, les fontes et ses alliages, l'aluminium et ses alliages, au magnésium ou autres, que les matières synthétiques. Inutile de se poser des questions et impossible de commettre une erreur, l'outil convient tout simplement et son rapport prix / performance est inégalé!

Nouvelle génération de forets pour l'usinage d'aciers à haute résistance élastique

Son affûtage à 4 pentes, avec amincissement d'âme spécial, réduit considérablement l'effort de coupe et élimine les vibrations. Ainsi, la tolérance du perçage réalisé est plus serrée. Le profil des goujures du foret est conçu de façon à faciliter l'évacuation des copeaux longs des matériaux tenaces.



L'affûtage à 4 pentes réduit l'effort de coupe et élimine les vibrations (schéma de gauche). Le profil circulaire des goujures optimise l'évacuation des copeaux (schéma du milieu et de droite).

Utilisation FU 500

Exemples d'applications

Désignation outil	FU 500 DZ	FU 500 DZ	FU 500 DZ	FU 500 DZ	FU 500 DZ	FU 500 DZ	FU 500 DZ	FU 500 DZ	FU 500 DZ
N° d'article	84806	84802	84806	84802	Outil spécial	Outil spécial	84804	84804	84804
Diamètre	4,5	5,56	2,5	5,5	2,38	6,8	6	6	6
Revêtement	TiN	TiN	TiN	TiN	AlTiN	FIRE	poli	poli	poli
Group de matière	Aciers de construction	Aciers inoxydables et austénitiques	Aciers de cémentation alliés	Aciers de construction	Aciers à outils	Aciers inoxydables et austénitiques	Aciers d'amélioration non-alliés	Aciers inoxydables et austénitiques	Bronze, à copeaux longs
Désignation matière	ST37/1.0039	XCrNi18-10/1.4304	20MnCr5/1.7147	St52-3/1.0570	100Cr6/1.2067	XCrNi18-10/1.4304	C45/1.0503	XCrNi18-10/1.4304	CuAl9Mn/2.0960
Profondeur [mm]	12	43	10	10	10	30,8	18	18	18
Trou	trou débouchant	trou débouchant	trou débouchant	trou borgne	trou borgne	trou débouchant	trou borgne	trou borgne	trou borgne
Arrosage	AK	AK	AK	AK	AK	AK	-	-	-
Liquide refroidiss.	huile soluble	huile soluble	huile soluble	huile soluble	huile	huile soluble	à sec	à sec	à sec
Machine	multibroches	BAZ	BAZ	BAZ	BAZ	BAZ	BAZ	BAZ	BAZ
v _c [mm/min]	40	40	72	34,6	48	10	28	7	22
f [mm/rev.]	0,1	0,1	0,08	0,1	0,06	0,08	0,1	0,06	0,8
Durée de vie [m]	25	9	54	85	25	30,5	Test de faisabilité		

P	M	K	N	S	H	Norme	Type	Matière de coupe	Surface	Sens de coupe	Forme d'attachement	Profondeur	d1/mm	N° d'article	Progr., page
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Forets hélicoïdaux courts



•	•	•	•	•		DIN 338	FU 500 DZ	HSS-E	○	à droite	cyl.	~5xD	1,000 - 14,000	84804	8
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•	•	•	•	•		DIN 338	FU 500 DZ	HSS-E	Ⓜ	à droite	cyl.	~5xD	1,000 - 14,000	84802	10
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Forets hélicoïdaux extra-courts



NEW

•	•	•	•	•		DIN 1897	FU 500 DZ	HSS-E	○	à droite	cyl.	~3xD	1,000 - 14,000	84808	12
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•	•	•	•	•		DIN 1897	FU 500 DZ	HSS-E	Ⓜ	à droite	cyl.	~3xD	1,000 - 14,000	84806	14
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Forets hélicoïd. à queue cylind. renforcée



•	•	•	•	•		Norme usine	FU 500	HSS-E	Ⓜ	à droite	HA	~3xD	2,000 - 20,000	84805	16
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•	•	•	•	•		Norme usine	FU 500	HSS-E	Ⓜ	à droite	HA	~5xD	2,000 - 20,000	84801	18
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Forets hélicoïdaux longs



•	•	•	•	•		DIN 340	FU 500 DZ	HSS-E	○	à droite	cyl.	~10xD	1,000 - 14,000	84814	20
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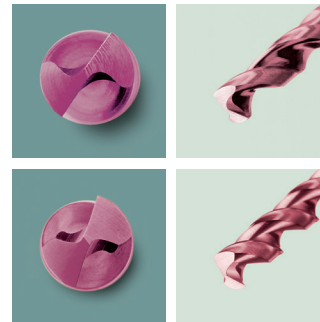
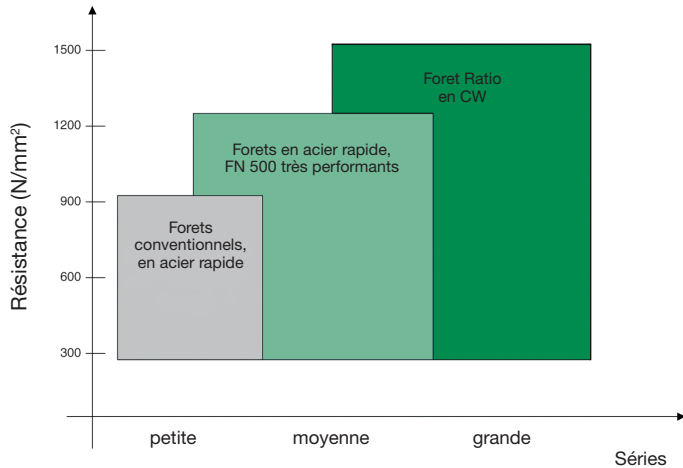
•	•	•	•	•		DIN 340	FU 500 DZ	HSS-E	Ⓜ	à droite	cyl.	~10xD	1,000 - 14,000	84812	22
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FN 500

L'argument pour le FN 500:

Avantageux, robuste, durée de vie élevée!

Ses bons résultats sont dus aux avantages des aciers rapides réunis à ceux des carbures métalliques. De plus, le revêtement FIRE les rend encore plus résistants aux températures d'usinage très élevées ce qui favorise la résistance à l'usure.



Constat évident : L'affûtage différent et le profil des goujures des forets FN 500 jusqu'à DIN 1897 (photos du haut) ou DIN 338 (photos du bas) optimisent les résultats d'usinage pour une profondeur de perçage continu.

Contrairement aux forets HSS-E, plus la taille de la série est importante, plus l'utilisation du foret Hartner FN500 permet une diminution du coût de production.

Exemples d'applications

Désignation outil	FN 500 DZ	FN 500 DZ	FN 500 DZ	FN 500 DZ	FN 500 DZ	FN 500 DZ
N° d'article	84511	84511	84511	84811	84811	84511
Diamètre	6,8	6,5	8	8,5	5	5
Revêtement	FIRE	FIRE	FIRE	TiN	TiN	FIRE
Group de matière	Aciers d'amélioration non-alliés	Aciers à outils	Aciers d'amélioration alliés	Aciers d'amélioration non-alliés	Aciers d'amélioration non-alliés	Aciers à outils
Désignation matière	C45/1.0503	102Cr6/1.2067	42CrMo4/1.7275	C60E/1.1221	C45/1.0503	102Cr6/1.2067
Profondeur [mm]	18	10	24	41	20	12,5
Trou	trou borgne	trou débouchant	trou borgne	trou débouchant	trou débouchant	trou débouchant
Arrosage	AK	AK	AK	AK	-	AK
Liquide refroidiss.	huile	huile soluble	huile soluble	huile soluble	à sec	à sec
Machine	BAZ	BAZ	BAZ	BAZ	BAZ	BAZ
v _c [mm/min]	38	30	40	23	35	15
f [mm/rev.]	0,1	0,1	0,16	0,16	0,1	0,08
Durée de vie [m]	191	30	27	67	Test de faisabilité	

P	M	K	N	S	H	Norme	Type	Matière de coupe	Surface	Sens de coupe	Forme d'attachement	Profondeur	d1/mm	N° d'article	Progr., page
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Forets hélicoïdaux courts



•	○	•	○	○	○	DIN 338	FN 500 DZ	HSS-E-PM	T	à droite	cyl.	~5xD	1,000 - 14,000	84811	24
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Forets hélicoïd. à queue cylind. renforcée



•	○	•	○	○	○	Norme usine	FN 500	HSS-E-PM	F	à droite	HA	~5xD	2,000 - 13,000	84507	25
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Forets hélicoïdaux extra-courts



•	○	•	○	○	○	DIN 1897	FN 500 DZ	HSS-E-PM	F	à droite	cyl.	~3xD	1,000 - 13,500	84511	27
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Forets hélicoïdaux courts

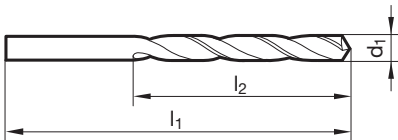
N° d'article 84804



P	M	K	N	S	H
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- Amin. de l'âme $\geq \varnothing 1,000$ • affûtage en pente • acier rapide au Co • faible effort d'avance nécessaire • faible effort de couple nécessaire
- pour applications universelles
- aciers alliés ou non alliés $< 800 \text{ N/mm}^2$ • aciers à outils, travail à froid ou à chaud • aciers à roulement • métaux non ferreux • fontes
- aciers inoxydables • matériaux synthétiques



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	34,000	12,000	4,650	80,000	47,000
1,100	36,000	14,000	4,700	80,000	47,000
1,200	38,000	16,000	4,760	86,000	52,000
1,300	38,000	16,000	4,800	86,000	52,000
1,400	40,000	18,000	4,900	86,000	52,000
1,500	40,000	18,000	5,000	86,000	52,000
1,600	43,000	20,000	5,100	86,000	52,000
1,700	43,000	20,000	5,200	86,000	52,000
1,800	46,000	22,000	5,300	86,000	52,000
1,900	46,000	22,000	5,400	93,000	57,000
2,000	49,000	24,000	5,500	93,000	57,000
2,100	49,000	24,000	5,550	93,000	57,000
2,200	53,000	27,000	5,560	93,000	57,000
2,300	53,000	27,000	5,600	93,000	57,000
2,380	57,000	30,000	5,700	93,000	57,000
2,400	57,000	30,000	5,800	93,000	57,000
2,500	57,000	30,000	5,900	93,000	57,000
2,600	57,000	30,000	6,000	93,000	57,000
2,700	61,000	33,000	6,100	101,000	63,000
2,780	61,000	33,000	6,200	101,000	63,000
2,800	61,000	33,000	6,300	101,000	63,000
2,900	61,000	33,000	6,350	101,000	63,000
3,000	61,000	33,000	6,400	101,000	63,000
3,100	65,000	36,000	6,500	101,000	63,000
3,170	65,000	36,000	6,600	101,000	63,000
3,200	65,000	36,000	6,700	101,000	63,000
3,300	65,000	36,000	6,800	109,000	69,000
3,400	70,000	39,000	6,900	109,000	69,000
3,500	70,000	39,000	7,000	109,000	69,000
3,570	70,000	39,000	7,100	109,000	69,000
3,600	70,000	39,000	7,200	109,000	69,000
3,700	70,000	39,000	7,300	109,000	69,000
3,800	75,000	43,000	7,400	109,000	69,000
3,900	75,000	43,000	7,500	109,000	69,000
3,970	75,000	43,000	7,600	117,000	75,000
4,000	75,000	43,000	7,700	117,000	75,000
4,100	75,000	43,000	7,800	117,000	75,000
4,200	75,000	43,000	7,900	117,000	75,000
4,300	80,000	47,000	7,940	117,000	75,000
4,400	80,000	47,000	8,000	117,000	75,000
4,500	80,000	47,000	8,100	117,000	75,000
4,600	80,000	47,000	8,200	117,000	75,000



Forets hélicoïdaux courts

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
8,300	117,000	75,000	10,500	133,000	87,000
8,400	117,000	75,000	11,000	142,000	94,000
8,500	117,000	75,000	11,110	142,000	94,000
8,600	125,000	81,000	11,200	142,000	94,000
8,700	125,000	81,000	11,500	142,000	94,000
8,800	125,000	81,000	12,000	151,000	101,000
9,000	125,000	81,000	12,500	151,000	101,000
9,100	125,000	81,000	13,000	151,000	101,000
9,250	125,000	81,000	13,500	160,000	108,000
9,300	125,000	81,000	14,000	160,000	108,000
9,500	125,000	81,000			
9,700	133,000	87,000			
9,800	133,000	87,000			
9,900	133,000	87,000			
10,000	133,000	87,000			
10,100	133,000	87,000			
10,200	133,000	87,000			
10,300	133,000	87,000			



Forets hélicoïdaux courts

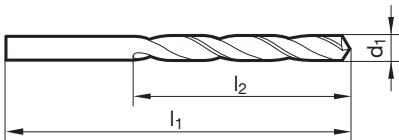
N° d'article 84802



P	M	K	N	S	H
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Amin. de l'âme $\geq \varnothing 1,000$ • affûtage en pente • acier rapide au Co • faible effort d'avance nécessaire • faible effort de couple nécessaire
 • meilleure résistance à l'usure • pour applications universelles
 aciers alliés ou non alliés $< 800 \text{ N/mm}^2$ • aciers à outils, travail à froid ou à chaud • aciers à roulement • métaux non ferreux • fontes
 • aciers inoxydables • matériaux synthétiques



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	34,000	12,000	4,600	80,000	47,000
1,100	36,000	14,000	4,650	80,000	47,000
1,200	38,000	16,000	4,700	80,000	47,000
1,300	38,000	16,000	4,760	86,000	52,000
1,400	40,000	18,000	4,800	86,000	52,000
1,500	40,000	18,000	4,900	86,000	52,000
1,600	43,000	20,000	5,000	86,000	52,000
1,700	43,000	20,000	5,100	86,000	52,000
1,800	46,000	22,000	5,160	86,000	52,000
1,900	46,000	22,000	5,200	86,000	52,000
2,000	49,000	24,000	5,300	86,000	52,000
2,100	49,000	24,000	5,400	93,000	57,000
2,200	53,000	27,000	5,500	93,000	57,000
2,300	53,000	27,000	5,550	93,000	57,000
2,380	57,000	30,000	5,560	93,000	57,000
2,400	57,000	30,000	5,600	93,000	57,000
2,500	57,000	30,000	5,700	93,000	57,000
2,600	57,000	30,000	5,800	93,000	57,000
2,700	61,000	33,000	5,900	93,000	57,000
2,780	61,000	33,000	5,950	93,000	57,000
2,800	61,000	33,000	6,000	93,000	57,000
2,900	61,000	33,000	6,100	101,000	63,000
3,000	61,000	33,000	6,200	101,000	63,000
3,100	65,000	36,000	6,300	101,000	63,000
3,170	65,000	36,000	6,350	101,000	63,000
3,200	65,000	36,000	6,400	101,000	63,000
3,300	65,000	36,000	6,500	101,000	63,000
3,400	70,000	39,000	6,600	101,000	63,000
3,500	70,000	39,000	6,700	101,000	63,000
3,570	70,000	39,000	6,800	109,000	69,000
3,600	70,000	39,000	6,900	109,000	69,000
3,700	70,000	39,000	7,000	109,000	69,000
3,800	75,000	43,000	7,100	109,000	69,000
3,900	75,000	43,000	7,140	109,000	69,000
3,970	75,000	43,000	7,200	109,000	69,000
4,000	75,000	43,000	7,300	109,000	69,000
4,100	75,000	43,000	7,400	109,000	69,000
4,200	75,000	43,000	7,500	109,000	69,000
4,300	80,000	47,000	7,600	117,000	75,000
4,370	80,000	47,000	7,700	117,000	75,000
4,400	80,000	47,000	7,800	117,000	75,000
4,500	80,000	47,000	7,900	117,000	75,000



Forets hélicoïdaux courts

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
7,940	117,000	75,000	9,600	133,000	87,000
8,000	117,000	75,000	9,700	133,000	87,000
8,100	117,000	75,000	9,800	133,000	87,000
8,200	117,000	75,000	9,900	133,000	87,000
8,300	117,000	75,000	10,000	133,000	87,000
8,400	117,000	75,000	10,100	133,000	87,000
8,500	117,000	75,000	10,200	133,000	87,000
8,600	125,000	81,000	10,300	133,000	87,000
8,700	125,000	81,000	10,500	133,000	87,000
8,730	125,000	81,000	11,000	142,000	94,000
8,800	125,000	81,000	11,110	142,000	94,000
8,900	125,000	81,000	11,200	142,000	94,000
9,000	125,000	81,000	11,500	142,000	94,000
9,100	125,000	81,000	12,000	151,000	101,000
9,200	125,000	81,000	12,500	151,000	101,000
9,300	125,000	81,000	13,000	151,000	101,000
9,400	125,000	81,000	13,500	160,000	108,000
9,500	125,000	81,000	14,000	160,000	108,000



Forets hélicoïdaux extra-courts

N° d'article 84808

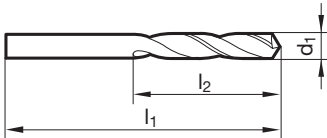


P	M	K	N	S	H
•	•	•	•		



Amin. de l'âme $\geq \varnothing 1,000$ • affûtage en pente • acier rapide au Co • faible effort d'avance nécessaire • faible effort de couple nécessaire
 • pour applications universelles

aciers alliés ou non alliés $< 800 \text{ N/mm}^2$ • aciers à outils, travail à froid ou à chaud • aciers à roulement • métaux non ferreux • fontes
 • aciers inoxydables • matériaux synthétiques



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	26,000	6,000	4,600	58,000	24,000
1,100	28,000	7,000	4,700	58,000	24,000
1,200	30,000	8,000	4,760	62,000	26,000
1,300	30,000	8,000	4,800	62,000	26,000
1,400	32,000	9,000	4,900	62,000	26,000
1,500	32,000	9,000	5,000	62,000	26,000
1,600	34,000	10,000	5,100	62,000	26,000
1,700	34,000	10,000	5,160	62,000	26,000
1,800	36,000	11,000	5,200	62,000	26,000
1,900	36,000	11,000	5,300	62,000	26,000
2,000	38,000	12,000	5,400	66,000	28,000
2,100	38,000	12,000	5,500	66,000	28,000
2,200	40,000	13,000	5,560	66,000	28,000
2,300	40,000	13,000	5,600	66,000	28,000
2,380	43,000	14,000	5,700	66,000	28,000
2,400	43,000	14,000	5,800	66,000	28,000
2,500	43,000	14,000	5,900	66,000	28,000
2,600	43,000	14,000	5,950	66,000	28,000
2,700	46,000	16,000	6,000	66,000	28,000
2,780	46,000	16,000	6,100	70,000	31,000
2,800	46,000	16,000	6,200	70,000	31,000
2,900	46,000	16,000	6,300	70,000	31,000
3,000	46,000	16,000	6,350	70,000	31,000
3,100	49,000	18,000	6,400	70,000	31,000
3,170	49,000	18,000	6,500	70,000	31,000
3,200	49,000	18,000	6,600	70,000	31,000
3,300	49,000	18,000	6,700	70,000	31,000
3,400	52,000	20,000	6,800	74,000	34,000
3,500	52,000	20,000	6,900	74,000	34,000
3,570	52,000	20,000	7,000	74,000	34,000
3,600	52,000	20,000	7,100	74,000	34,000
3,700	52,000	20,000	7,140	74,000	34,000
3,800	55,000	22,000	7,200	74,000	34,000
3,900	55,000	22,000	7,300	74,000	34,000
3,970	55,000	22,000	7,400	74,000	34,000
4,000	55,000	22,000	7,500	74,000	34,000
4,100	55,000	22,000	7,600	79,000	37,000
4,200	55,000	22,000	7,700	79,000	37,000
4,300	58,000	24,000	7,800	79,000	37,000
4,370	58,000	24,000	7,900	79,000	37,000
4,400	58,000	24,000	7,940	79,000	37,000
4,500	58,000	24,000	8,000	79,000	37,000



Forets hélicoïdaux extra-courts

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
8,100	79,000	37,000	9,800	89,000	43,000
8,200	79,000	37,000	9,900	89,000	43,000
8,300	79,000	37,000	10,000	89,000	43,000
8,400	79,000	37,000	10,100	89,000	43,000
8,500	79,000	37,000	10,200	89,000	43,000
8,600	84,000	40,000	10,300	89,000	43,000
8,700	84,000	40,000	10,400	89,000	43,000
8,730	84,000	40,000	10,500	89,000	43,000
8,800	84,000	40,000	11,000	95,000	47,000
8,900	84,000	40,000	11,110	95,000	47,000
9,000	84,000	40,000	11,500	95,000	47,000
9,100	84,000	40,000	12,000	102,000	51,000
9,200	84,000	40,000	12,500	102,000	51,000
9,300	84,000	40,000	13,000	102,000	51,000
9,400	84,000	40,000	13,500	107,000	54,000
9,500	84,000	40,000	14,000	107,000	54,000
9,600	89,000	43,000			
9,700	89,000	43,000			



Forets hélicoïdaux extra-courts

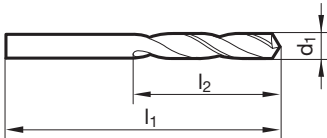
N° d'article 84806



P	M	K	N	S	H
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- Amin. de l'âme $\geq \varnothing 1,000$ • affûtage en pente • acier rapide au Co • faible effort d'avance nécessaire • faible effort de couple nécessaire
- pour applications universelles
- aciers alliés ou non alliés $< 800 \text{ N/mm}^2$ • aciers à outils, travail à froid ou à chaud • aciers à roulement • métaux non ferreux • fontes
- aciers inoxydables • matériaux synthétiques



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	26,000	6,000	5,100	62,000	26,000
1,100	28,000	7,000	5,160	62,000	26,000
1,200	30,000	8,000	5,200	62,000	26,000
1,300	30,000	8,000	5,300	62,000	26,000
1,400	32,000	9,000	5,400	66,000	28,000
1,500	32,000	9,000	5,500	66,000	28,000
1,600	34,000	10,000	5,560	66,000	28,000
1,700	34,000	10,000	5,600	66,000	28,000
1,800	36,000	11,000	5,700	66,000	28,000
1,900	36,000	11,000	5,800	66,000	28,000
2,000	38,000	12,000	5,900	66,000	28,000
2,100	38,000	12,000	5,950	66,000	28,000
2,200	40,000	13,000	6,000	66,000	28,000
2,300	40,000	13,000	6,100	70,000	31,000
2,400	43,000	14,000	6,200	70,000	31,000
2,500	43,000	14,000	6,300	70,000	31,000
2,600	43,000	14,000	6,350	70,000	31,000
2,700	46,000	16,000	6,400	70,000	31,000
2,800	46,000	16,000	6,500	70,000	31,000
2,900	46,000	16,000	6,600	70,000	31,000
3,000	46,000	16,000	6,700	70,000	31,000
3,100	49,000	18,000	6,800	74,000	34,000
3,200	49,000	18,000	6,900	74,000	34,000
3,300	49,000	18,000	7,000	74,000	34,000
3,400	52,000	20,000	7,100	74,000	34,000
3,500	52,000	20,000	7,140	74,000	34,000
3,600	52,000	20,000	7,200	74,000	34,000
3,700	52,000	20,000	7,300	74,000	34,000
3,800	55,000	22,000	7,400	74,000	34,000
3,900	55,000	22,000	7,500	74,000	34,000
4,000	55,000	22,000	7,600	79,000	37,000
4,100	55,000	22,000	7,700	79,000	37,000
4,200	55,000	22,000	7,800	79,000	37,000
4,300	58,000	24,000	7,900	79,000	37,000
4,400	58,000	24,000	8,000	79,000	37,000
4,500	58,000	24,000	8,100	79,000	37,000
4,600	58,000	24,000	8,200	79,000	37,000
4,700	58,000	24,000	8,300	79,000	37,000
4,760	62,000	26,000	8,400	79,000	37,000
4,800	62,000	26,000	8,500	79,000	37,000
4,900	62,000	26,000	8,600	84,000	40,000
5,000	62,000	26,000	8,700	84,000	40,000



Forets hélicoïdaux extra-courts

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
8,730	84,000	40,000	11,110	95,000	47,000
8,800	84,000	40,000	11,500	95,000	47,000
9,000	84,000	40,000	12,000	102,000	51,000
9,300	84,000	40,000	12,500	102,000	51,000
9,500	84,000	40,000	13,000	102,000	51,000
9,800	89,000	43,000	13,500	107,000	54,000
10,000	89,000	43,000	14,000	107,000	54,000
10,100	89,000	43,000			
10,200	89,000	43,000			
10,300	89,000	43,000			
10,500	89,000	43,000			
11,000	95,000	47,000			



Forets hélicoïd. à queue cylind. renforcée

N° d'article 84805

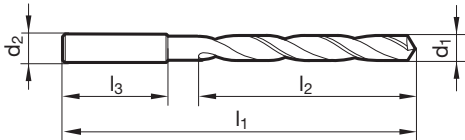


P	M	K	N	S	H
•	•	•	•		



Amin. de l'âme $\geq \varnothing 2,000$ • affûtage en pente • acier rapide au Co • faible effort d'avance nécessaire • faible effort de couple nécessaire
 • meilleure résistance à l'usure • pour applications universelles

aciers alliés ou non alliés $< 800 \text{ N/mm}^2$ • aciers à outils, travail à froid ou à chaud • aciers inoxydables • métaux non ferreux • fontes
 • matériaux synthétiques • aciers à roulement



d1	d2	l1	l2	l3	d1	d2	l1	l2	l3
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2,000	3,000	44,000	12,000	28,000	5,300	6,000	70,000	26,000	36,000
2,100	3,000	44,000	12,000	28,000	5,400	6,000	72,000	28,000	36,000
2,200	3,000	45,000	13,000	28,000	5,500	6,000	72,000	28,000	36,000
2,300	3,000	45,000	13,000	28,000	5,550	6,000	72,000	28,000	36,000
2,380	3,000	46,000	14,000	28,000	5,560	6,000	72,000	28,000	36,000
2,400	3,000	46,000	14,000	28,000	5,600	6,000	72,000	28,000	36,000
2,500	3,000	46,000	14,000	28,000	5,700	6,000	72,000	28,000	36,000
2,600	3,000	46,000	14,000	28,000	5,800	6,000	72,000	28,000	36,000
2,700	3,000	48,000	16,000	28,000	5,900	6,000	72,000	28,000	36,000
2,780	3,000	48,000	16,000	28,000	5,950	6,000	72,000	28,000	36,000
2,800	3,000	48,000	16,000	28,000	6,000	6,000	72,000	28,000	36,000
2,900	3,000	48,000	16,000	28,000	6,100	8,000	75,000	31,000	36,000
3,000	3,000	48,000	16,000	28,000	6,200	8,000	75,000	31,000	36,000
3,100	4,000	50,000	18,000	28,000	6,300	8,000	75,000	31,000	36,000
3,170	4,000	50,000	18,000	28,000	6,350	8,000	75,000	31,000	36,000
3,200	4,000	50,000	18,000	28,000	6,400	8,000	75,000	31,000	36,000
3,300	4,000	50,000	18,000	28,000	6,500	8,000	75,000	31,000	36,000
3,400	4,000	52,000	20,000	28,000	6,600	8,000	75,000	31,000	36,000
3,500	4,000	52,000	20,000	28,000	6,700	8,000	75,000	31,000	36,000
3,570	4,000	52,000	20,000	28,000	6,750	8,000	78,000	34,000	36,000
3,600	4,000	52,000	20,000	28,000	6,800	8,000	78,000	34,000	36,000
3,700	4,000	52,000	20,000	28,000	6,900	8,000	78,000	34,000	36,000
3,800	4,000	54,000	22,000	28,000	7,000	8,000	78,000	34,000	36,000
3,900	4,000	54,000	22,000	28,000	7,100	8,000	78,000	34,000	36,000
3,970	4,000	54,000	22,000	28,000	7,140	8,000	78,000	34,000	36,000
4,000	4,000	54,000	22,000	28,000	7,200	8,000	78,000	34,000	36,000
4,100	6,000	66,000	22,000	36,000	7,300	8,000	78,000	34,000	36,000
4,200	6,000	66,000	22,000	36,000	7,400	8,000	78,000	34,000	36,000
4,300	6,000	68,000	24,000	36,000	7,500	8,000	78,000	34,000	36,000
4,370	6,000	68,000	24,000	36,000	7,540	8,000	81,000	37,000	36,000
4,400	6,000	68,000	24,000	36,000	7,550	8,000	81,000	37,000	36,000
4,500	6,000	68,000	24,000	36,000	7,600	8,000	81,000	37,000	36,000
4,600	6,000	68,000	24,000	36,000	7,700	8,000	81,000	37,000	36,000
4,650	6,000	68,000	24,000	36,000	7,800	8,000	81,000	37,000	36,000
4,700	6,000	68,000	24,000	36,000	7,900	8,000	81,000	37,000	36,000
4,760	6,000	70,000	26,000	36,000	7,940	8,000	81,000	37,000	36,000
4,800	6,000	70,000	26,000	36,000	8,000	8,000	81,000	37,000	36,000
4,900	6,000	70,000	26,000	36,000	8,100	10,000	87,000	37,000	40,000
5,000	6,000	70,000	26,000	36,000	8,200	10,000	87,000	37,000	40,000
5,100	6,000	70,000	26,000	36,000	8,300	10,000	87,000	37,000	40,000
5,160	6,000	70,000	26,000	36,000	8,330	10,000	87,000	37,000	40,000
5,200	6,000	70,000	26,000	36,000	8,400	10,000	87,000	37,000	40,000



Forets hélicoïd. à queue cylind. renforcée

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
8,500	10,000	87,000	37,000	40,000	11,800	12,000	104,000	47,000	45,000
8,600	10,000	91,000	40,000	40,000	11,900	12,000	108,000	51,000	45,000
8,700	10,000	91,000	40,000	40,000	11,910	12,000	108,000	51,000	45,000
8,730	10,000	91,000	40,000	40,000	12,000	12,000	108,000	51,000	45,000
8,800	10,000	91,000	40,000	40,000	12,100	16,000	111,000	51,000	48,000
8,900	10,000	91,000	40,000	40,000	12,200	16,000	111,000	51,000	48,000
9,000	10,000	91,000	40,000	40,000	12,300	16,000	111,000	51,000	48,000
9,100	10,000	91,000	40,000	40,000	12,400	16,000	111,000	51,000	48,000
9,130	10,000	91,000	40,000	40,000	12,500	16,000	111,000	51,000	48,000
9,200	10,000	91,000	40,000	40,000	12,600	16,000	111,000	51,000	48,000
9,300	10,000	91,000	40,000	40,000	12,700	16,000	111,000	51,000	48,000
9,400	10,000	91,000	40,000	40,000	12,800	16,000	111,000	51,000	48,000
9,500	10,000	91,000	40,000	40,000	12,900	16,000	111,000	51,000	48,000
9,520	10,000	93,000	43,000	40,000	13,000	16,000	111,000	51,000	48,000
9,550	10,000	93,000	43,000	40,000	13,100	16,000	111,000	51,000	48,000
9,600	10,000	93,000	43,000	40,000	13,490	16,000	114,000	54,000	48,000
9,700	10,000	93,000	43,000	40,000	13,500	16,000	114,000	54,000	48,000
9,800	10,000	93,000	43,000	40,000	13,890	16,000	114,000	54,000	48,000
9,900	10,000	93,000	43,000	40,000	14,000	16,000	114,000	54,000	48,000
9,920	10,000	93,000	43,000	40,000	14,290	16,000	116,000	56,000	48,000
10,000	10,000	93,000	43,000	40,000	14,500	16,000	116,000	56,000	48,000
10,100	12,000	100,000	43,000	45,000	15,000	16,000	116,000	56,000	48,000
10,200	12,000	100,000	43,000	45,000	15,500	16,000	118,000	58,000	48,000
10,300	12,000	100,000	43,000	45,000	15,870	16,000	118,000	58,000	48,000
10,320	12,000	100,000	43,000	45,000	16,000	16,000	118,000	58,000	48,000
10,400	12,000	100,000	43,000	45,000	16,500	20,000	126,000	60,000	50,000
10,500	12,000	100,000	43,000	45,000	16,670	20,000	126,000	60,000	50,000
10,600	12,000	100,000	43,000	45,000	17,000	20,000	126,000	60,000	50,000
10,700	12,000	104,000	47,000	45,000	17,500	20,000	128,000	62,000	50,000
10,720	12,000	104,000	47,000	45,000	18,000	20,000	128,000	62,000	50,000
10,800	12,000	104,000	47,000	45,000	18,500	20,000	130,000	64,000	50,000
10,900	12,000	104,000	47,000	45,000	19,000	20,000	130,000	64,000	50,000
11,000	12,000	104,000	47,000	45,000	19,500	20,000	132,000	66,000	50,000
11,100	12,000	104,000	47,000	45,000	20,000	20,000	132,000	66,000	50,000
11,110	12,000	104,000	47,000	45,000					
11,200	12,000	104,000	47,000	45,000					
11,300	12,000	104,000	47,000	45,000					
11,400	12,000	104,000	47,000	45,000					
11,500	12,000	104,000	47,000	45,000					
11,510	12,000	104,000	47,000	45,000					
11,600	12,000	104,000	47,000	45,000					
11,700	12,000	104,000	47,000	45,000					



Forets hélicoïd. à queue cylind. renforcée

N° d'article 84801

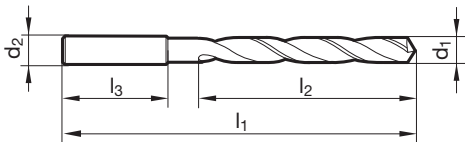


P	M	K	N	S	H
•	•	•	•		



Amin. de l'âme $\geq \varnothing 2,000$ • affûtage en pente • acier rapide au Co • faible effort d'avance nécessaire • faible effort de couple nécessaire
 • meilleure résistance à l'usure • pour applications universelles

aciers alliés ou non alliés $< 800 \text{ N/mm}^2$ • aciers à outils, travail à froid ou à chaud • aciers inoxydables • métaux non ferreux • fontes
 • matériaux synthétiques



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
2,000	3,000	56,000	24,000	28,000	5,300	6,000	96,000	52,000	36,000
2,100	3,000	56,000	24,000	28,000	5,400	6,000	101,000	57,000	36,000
2,200	3,000	59,000	27,000	28,000	5,500	6,000	101,000	57,000	36,000
2,300	3,000	59,000	27,000	28,000	5,550	6,000	101,000	57,000	36,000
2,380	3,000	62,000	30,000	28,000	5,560	6,000	101,000	57,000	36,000
2,400	3,000	62,000	30,000	28,000	5,600	6,000	101,000	57,000	36,000
2,500	3,000	62,000	30,000	28,000	5,700	6,000	101,000	57,000	36,000
2,600	3,000	62,000	30,000	28,000	5,800	6,000	101,000	57,000	36,000
2,700	3,000	65,000	33,000	28,000	5,900	6,000	101,000	57,000	36,000
2,780	3,000	65,000	33,000	28,000	5,950	6,000	101,000	57,000	36,000
2,800	3,000	65,000	33,000	28,000	6,000	6,000	101,000	57,000	36,000
2,900	3,000	65,000	33,000	28,000	6,100	8,000	107,000	63,000	36,000
3,000	3,000	65,000	33,000	28,000	6,200	8,000	107,000	63,000	36,000
3,100	4,000	68,000	36,000	28,000	6,300	8,000	107,000	63,000	36,000
3,170	4,000	68,000	36,000	28,000	6,350	8,000	107,000	63,000	36,000
3,200	4,000	68,000	36,000	28,000	6,400	8,000	107,000	63,000	36,000
3,300	4,000	68,000	36,000	28,000	6,500	8,000	107,000	63,000	36,000
3,400	4,000	71,000	39,000	28,000	6,600	8,000	107,000	63,000	36,000
3,500	4,000	71,000	39,000	28,000	6,700	8,000	107,000	63,000	36,000
3,570	4,000	71,000	39,000	28,000	6,750	8,000	113,000	69,000	36,000
3,600	4,000	71,000	39,000	28,000	6,800	8,000	113,000	69,000	36,000
3,700	4,000	71,000	39,000	28,000	6,900	8,000	113,000	69,000	36,000
3,800	4,000	75,000	43,000	28,000	7,000	8,000	113,000	69,000	36,000
3,900	4,000	75,000	43,000	28,000	7,100	8,000	113,000	69,000	36,000
3,970	4,000	75,000	43,000	28,000	7,140	8,000	113,000	69,000	36,000
4,000	4,000	75,000	43,000	28,000	7,200	8,000	113,000	69,000	36,000
4,100	6,000	87,000	43,000	36,000	7,300	8,000	113,000	69,000	36,000
4,200	6,000	87,000	43,000	36,000	7,400	8,000	113,000	69,000	36,000
4,300	6,000	91,000	47,000	36,000	7,500	8,000	113,000	69,000	36,000
4,370	6,000	91,000	47,000	36,000	7,540	8,000	119,000	75,000	36,000
4,400	6,000	91,000	47,000	36,000	7,550	8,000	119,000	75,000	36,000
4,500	6,000	91,000	47,000	36,000	7,600	8,000	119,000	75,000	36,000
4,600	6,000	91,000	47,000	36,000	7,700	8,000	119,000	75,000	36,000
4,650	6,000	91,000	47,000	36,000	7,800	8,000	119,000	75,000	36,000
4,700	6,000	91,000	47,000	36,000	7,900	8,000	119,000	75,000	36,000
4,760	6,000	96,000	52,000	36,000	7,940	8,000	119,000	75,000	36,000
4,800	6,000	96,000	52,000	36,000	8,000	8,000	119,000	75,000	36,000
4,900	6,000	96,000	52,000	36,000	8,100	10,000	125,000	75,000	40,000
5,000	6,000	96,000	52,000	36,000	8,200	10,000	125,000	75,000	40,000
5,100	6,000	96,000	52,000	36,000	8,300	10,000	125,000	75,000	40,000
5,160	6,000	96,000	52,000	36,000	8,330	10,000	125,000	75,000	40,000
5,200	6,000	96,000	52,000	36,000	8,400	10,000	125,000	75,000	40,000



Forets hélicoïd. à queue cylind. renforcée

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
8,500	10,000	125,000	75,000	40,000	11,800	12,000	151,000	94,000	45,000
8,600	10,000	131,000	81,000	40,000	11,900	12,000	158,000	101,000	45,000
8,700	10,000	131,000	81,000	40,000	11,910	12,000	158,000	101,000	45,000
8,730	10,000	131,000	81,000	40,000	12,000	12,000	158,000	101,000	45,000
8,800	10,000	131,000	81,000	40,000	12,100	16,000	161,000	101,000	48,000
8,900	10,000	131,000	81,000	40,000	12,200	16,000	161,000	101,000	48,000
9,000	10,000	131,000	81,000	40,000	12,300	16,000	161,000	101,000	48,000
9,100	10,000	131,000	81,000	40,000	12,400	16,000	161,000	101,000	48,000
9,130	10,000	131,000	81,000	40,000	12,500	16,000	161,000	101,000	48,000
9,200	10,000	131,000	81,000	40,000	12,600	16,000	161,000	101,000	48,000
9,300	10,000	131,000	81,000	40,000	12,700	16,000	161,000	101,000	48,000
9,400	10,000	131,000	81,000	40,000	12,800	16,000	161,000	101,000	48,000
9,500	10,000	131,000	81,000	40,000	12,900	16,000	161,000	101,000	48,000
9,520	10,000	137,000	87,000	40,000	13,000	16,000	161,000	101,000	48,000
9,550	10,000	137,000	87,000	40,000	13,100	16,000	161,000	101,000	48,000
9,600	10,000	137,000	87,000	40,000	13,490	16,000	166,000	106,000	48,000
9,700	10,000	137,000	87,000	40,000	13,500	16,000	166,000	106,000	48,000
9,800	10,000	137,000	87,000	40,000	13,890	16,000	166,000	106,000	48,000
9,900	10,000	137,000	87,000	40,000	14,000	16,000	166,000	106,000	48,000
9,920	10,000	137,000	87,000	40,000	14,290	16,000	169,000	109,000	48,000
10,000	10,000	137,000	87,000	40,000	14,500	16,000	169,000	109,000	48,000
10,100	12,000	144,000	87,000	45,000	15,000	16,000	169,000	109,000	48,000
10,200	12,000	144,000	87,000	45,000	15,500	16,000	172,000	112,000	48,000
10,300	12,000	144,000	87,000	45,000	15,870	16,000	172,000	112,000	48,000
10,320	12,000	144,000	87,000	45,000	16,000	16,000	172,000	112,000	48,000
10,400	12,000	144,000	87,000	45,000	16,500	20,000	181,000	115,000	50,000
10,500	12,000	144,000	87,000	45,000	16,670	20,000	181,000	115,000	50,000
10,600	12,000	144,000	87,000	45,000	17,000	20,000	181,000	115,000	50,000
10,700	12,000	151,000	94,000	45,000	17,460	20,000	184,000	118,000	50,000
10,720	12,000	151,000	94,000	45,000	17,500	20,000	184,000	118,000	50,000
10,800	12,000	151,000	94,000	45,000	18,000	20,000	184,000	118,000	50,000
10,900	12,000	151,000	94,000	45,000	18,500	20,000	188,000	122,000	50,000
11,000	12,000	151,000	94,000	45,000	19,000	20,000	188,000	122,000	50,000
11,100	12,000	151,000	94,000	45,000	19,500	20,000	191,000	125,000	50,000
11,110	12,000	151,000	94,000	45,000	20,000	20,000	191,000	125,000	50,000
11,200	12,000	151,000	94,000	45,000					
11,300	12,000	151,000	94,000	45,000					
11,400	12,000	151,000	94,000	45,000					
11,500	12,000	151,000	94,000	45,000					
11,510	12,000	151,000	94,000	45,000					
11,600	12,000	151,000	94,000	45,000					
11,700	12,000	151,000	94,000	45,000					



Forets hélicoïdaux longs

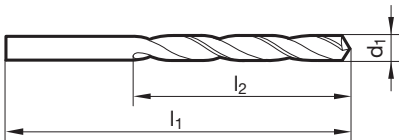
N° d'article 84814



P	M	K	N	S	H
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Amin. de l'âme $\geq \varnothing 1,000$ • affûtage en pente • acier rapide au Co • faible effort d'avance nécessaire • faible effort de couple nécessaire
 • meilleure résistance à l'usure • pour applications universelles
 aciers alliés ou non alliés $< 800 \text{ N/mm}^2$ • aciers à outils, travail à froid ou à chaud • aciers à roulement • métaux non ferreux • fontes
 • aciers inoxydables • matériaux synthétiques



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	56,000	33,000	5,200	132,000	87,000
1,100	60,000	37,000	5,300	132,000	87,000
1,200	65,000	41,000	5,400	139,000	91,000
1,300	65,000	41,000	5,500	139,000	91,000
1,400	70,000	45,000	5,600	139,000	91,000
1,500	70,000	45,000	5,700	139,000	91,000
1,600	76,000	50,000	5,800	139,000	91,000
1,700	76,000	50,000	5,900	139,000	91,000
1,800	80,000	53,000	6,000	139,000	91,000
1,900	80,000	53,000	6,100	148,000	97,000
2,000	85,000	56,000	6,200	148,000	97,000
2,100	85,000	56,000	6,300	148,000	97,000
2,200	90,000	59,000	6,400	148,000	97,000
2,300	90,000	59,000	6,500	148,000	97,000
2,400	95,000	62,000	6,600	148,000	97,000
2,500	95,000	62,000	6,700	148,000	97,000
2,600	95,000	62,000	6,800	156,000	102,000
2,700	100,000	66,000	6,900	156,000	102,000
2,800	100,000	66,000	7,000	156,000	102,000
2,900	100,000	66,000	7,100	156,000	102,000
3,000	100,000	66,000	7,200	156,000	102,000
3,100	106,000	69,000	7,300	156,000	102,000
3,200	106,000	69,000	7,400	156,000	102,000
3,300	106,000	69,000	7,500	156,000	102,000
3,400	112,000	73,000	7,600	165,000	109,000
3,500	112,000	73,000	7,700	165,000	109,000
3,600	112,000	73,000	7,800	165,000	109,000
3,700	112,000	73,000	7,900	165,000	109,000
3,800	119,000	78,000	8,000	165,000	109,000
3,900	119,000	78,000	8,100	165,000	109,000
4,000	119,000	78,000	8,200	165,000	109,000
4,100	119,000	78,000	8,300	165,000	109,000
4,200	119,000	78,000	8,400	165,000	109,000
4,300	126,000	82,000	8,500	165,000	109,000
4,400	126,000	82,000	8,600	175,000	115,000
4,500	126,000	82,000	8,700	175,000	115,000
4,600	126,000	82,000	8,800	175,000	115,000
4,700	126,000	82,000	9,000	175,000	115,000
4,800	132,000	87,000	9,100	175,000	115,000
4,900	132,000	87,000	9,200	175,000	115,000
5,000	132,000	87,000	9,300	175,000	115,000
5,100	132,000	87,000	9,400	175,000	115,000



Forets hélicoïdaux longs

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
9,500	175,000	115,000	11,500	195,000	128,000
9,600	184,000	121,000	12,000	205,000	134,000
9,700	184,000	121,000	12,500	205,000	134,000
9,800	184,000	121,000	13,000	205,000	134,000
9,900	184,000	121,000	13,500	214,000	140,000
10,000	184,000	121,000	14,000	214,000	140,000
10,100	184,000	121,000			
10,200	184,000	121,000			
10,300	184,000	121,000			
10,400	184,000	121,000			
10,500	184,000	121,000			
11,000	195,000	128,000			



Forets hélicoïdaux longs

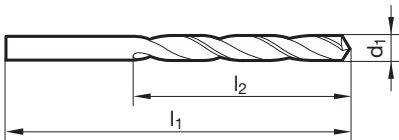
N° d'article 84812



P	M	K	N	S	H
•	•	•	•		



- Amin. de l'âme $\geq \varnothing 1,000$ • affûtage en pente • acier rapide au Co • faible effort de couple nécessaire • faible effort d'avance nécessaire
- meilleure résistance à l'usure • pour applications universelles
- aciers alliés ou non alliés $< 800 \text{ N/mm}^2$ • aciers à outils, travail à froid ou à chaud • aciers à roulement • métaux non ferreux • fontes
- matériaux synthétiques • aciers inoxydables



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	56,000	33,000	5,200	132,000	87,000
1,100	60,000	37,000	5,300	132,000	87,000
1,200	65,000	41,000	5,400	139,000	91,000
1,300	65,000	41,000	5,500	139,000	91,000
1,400	70,000	45,000	5,600	139,000	91,000
1,500	70,000	45,000	5,700	139,000	91,000
1,600	76,000	50,000	5,800	139,000	91,000
1,700	76,000	50,000	5,900	139,000	91,000
1,800	80,000	53,000	6,000	139,000	91,000
1,900	80,000	53,000	6,100	148,000	97,000
2,000	85,000	56,000	6,200	148,000	97,000
2,100	85,000	56,000	6,300	148,000	97,000
2,200	90,000	59,000	6,400	148,000	97,000
2,300	90,000	59,000	6,500	148,000	97,000
2,400	95,000	62,000	6,600	148,000	97,000
2,500	95,000	62,000	6,700	148,000	97,000
2,600	95,000	62,000	6,800	156,000	102,000
2,700	100,000	66,000	6,900	156,000	102,000
2,800	100,000	66,000	7,000	156,000	102,000
2,900	100,000	66,000	7,100	156,000	102,000
3,000	100,000	66,000	7,200	156,000	102,000
3,100	106,000	69,000	7,300	156,000	102,000
3,200	106,000	69,000	7,400	156,000	102,000
3,300	106,000	69,000	7,500	156,000	102,000
3,400	112,000	73,000	7,600	165,000	109,000
3,500	112,000	73,000	7,700	165,000	109,000
3,600	112,000	73,000	7,800	165,000	109,000
3,700	112,000	73,000	7,900	165,000	109,000
3,800	119,000	78,000	8,000	165,000	109,000
3,900	119,000	78,000	8,100	165,000	109,000
4,000	119,000	78,000	8,200	165,000	109,000
4,100	119,000	78,000	8,300	165,000	109,000
4,200	119,000	78,000	8,400	165,000	109,000
4,300	126,000	82,000	8,500	165,000	109,000
4,400	126,000	82,000	8,600	175,000	115,000
4,500	126,000	82,000	8,700	175,000	115,000
4,600	126,000	82,000	8,800	175,000	115,000
4,700	126,000	82,000	9,000	175,000	115,000
4,800	132,000	87,000	9,100	175,000	115,000
4,900	132,000	87,000	9,200	175,000	115,000
5,000	132,000	87,000	9,300	175,000	115,000
5,100	132,000	87,000	9,400	175,000	115,000



Forets hélicoïdaux longs

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
9,500	175,000	115,000	11,500	195,000	128,000
9,600	184,000	121,000	12,000	205,000	134,000
9,700	184,000	121,000	12,500	205,000	134,000
9,800	184,000	121,000	13,000	205,000	134,000
9,900	184,000	121,000	13,500	214,000	140,000
10,000	184,000	121,000	14,000	214,000	140,000
10,100	184,000	121,000			
10,200	184,000	121,000			
10,300	184,000	121,000			
10,400	184,000	121,000			
10,500	184,000	121,000			
11,000	195,000	128,000			

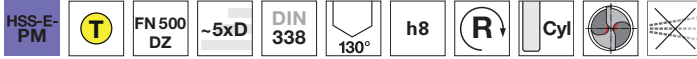


Forets hélicoïdaux courts

N° d'article 84811

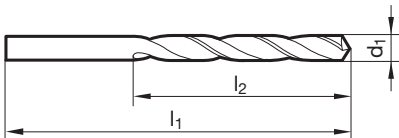


P	M	K	N	S	H
●	○	●	○	○	○



Amin. de l'âme $\geq \varnothing 1,000$ • affûtage à dépouille conique • acier PM HSS fritté et allié au Co • particulièrement rigide • résistance à l'usure particulièrement élevée

aciers hautement alliés • aciers de cémentation et d'amélioration • fontes, laiton, bronzes



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	34,000	12,000	5,560	93,000	57,000
1,200	38,000	16,000	5,950	93,000	57,000
1,300	38,000	16,000	6,000	93,000	57,000
1,400	40,000	18,000	6,300	101,000	63,000
1,500	40,000	18,000	6,350	101,000	63,000
1,600	43,000	20,000	6,700	101,000	63,000
1,700	43,000	20,000	6,800	109,000	69,000
1,900	46,000	22,000	7,000	109,000	69,000
2,000	49,000	24,000	7,140	109,000	69,000
2,100	49,000	24,000	7,400	109,000	69,000
2,200	53,000	27,000	7,900	117,000	75,000
2,300	53,000	27,000	7,940	117,000	75,000
2,380	57,000	30,000	8,000	117,000	75,000
2,500	57,000	30,000	8,500	117,000	75,000
2,600	57,000	30,000	8,730	125,000	81,000
2,780	61,000	33,000	9,000	125,000	81,000
2,800	61,000	33,000	9,300	125,000	81,000
2,900	61,000	33,000	9,500	125,000	81,000
3,000	61,000	33,000	9,800	133,000	87,000
3,100	65,000	36,000	10,000	133,000	87,000
3,170	65,000	36,000	10,200	133,000	87,000
3,300	65,000	36,000	10,500	133,000	87,000
3,500	70,000	39,000	11,000	142,000	94,000
3,570	70,000	39,000	11,110	142,000	94,000
3,600	70,000	39,000	11,500	142,000	94,000
3,700	70,000	39,000	12,000	151,000	101,000
3,900	75,000	43,000	12,500	151,000	101,000
4,000	75,000	43,000	13,000	151,000	101,000
4,100	75,000	43,000	13,500	160,000	108,000
4,200	75,000	43,000	14,000	160,000	108,000
4,760	86,000	52,000			
4,800	86,000	52,000			
5,000	86,000	52,000			
5,160	86,000	52,000			
5,400	93,000	57,000			
5,500	93,000	57,000			

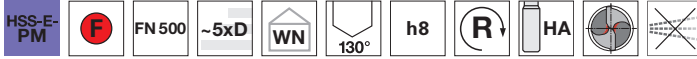


Forets hélicoïd. à queue cylind. renforcée

N° d'article 84507

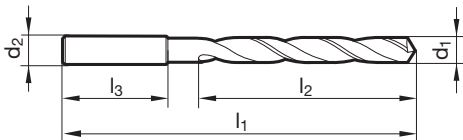


P	M	K	N	S	H
●	○	●	○	○	○



Amin. de l'âme $\geq \varnothing 2,000$ • affûtage à dépouille conique • acier PM HSS fritté et allié au Co • résistance à l'usure particulièrement élevée • particulièrement rigide

mat. haute résistance, aciers hautement alliés • aciers de cémentation et d'amélioration • fontes, laitons, bronzes



d1	d2	l1	l2	l3	d1	d2	l1	l2	l3
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2,000	3,000	56,000	24,000	28,000	5,300	6,000	96,000	52,000	36,000
2,100	3,000	56,000	24,000	28,000	5,400	6,000	101,000	57,000	36,000
2,200	3,000	59,000	27,000	28,000	5,500	6,000	101,000	57,000	36,000
2,300	3,000	59,000	27,000	28,000	5,550	6,000	101,000	57,000	36,000
2,380	3,000	62,000	30,000	28,000	5,560	6,000	101,000	57,000	36,000
2,400	3,000	62,000	30,000	28,000	5,600	6,000	101,000	57,000	36,000
2,500	3,000	62,000	30,000	28,000	5,700	6,000	101,000	57,000	36,000
2,600	3,000	62,000	30,000	28,000	5,800	6,000	101,000	57,000	36,000
2,700	3,000	65,000	33,000	28,000	5,900	6,000	101,000	57,000	36,000
2,780	3,000	65,000	33,000	28,000	5,950	6,000	101,000	57,000	36,000
2,800	3,000	65,000	33,000	28,000	6,000	6,000	101,000	57,000	36,000
2,900	3,000	65,000	33,000	28,000	6,100	8,000	107,000	63,000	36,000
3,000	3,000	65,000	33,000	28,000	6,200	8,000	107,000	63,000	36,000
3,100	4,000	68,000	36,000	28,000	6,300	8,000	107,000	63,000	36,000
3,170	4,000	68,000	36,000	28,000	6,350	8,000	107,000	63,000	36,000
3,200	4,000	68,000	36,000	28,000	6,400	8,000	107,000	63,000	36,000
3,300	4,000	68,000	36,000	28,000	6,500	8,000	107,000	63,000	36,000
3,400	4,000	71,000	39,000	28,000	6,600	8,000	107,000	63,000	36,000
3,500	4,000	71,000	39,000	28,000	6,700	8,000	107,000	63,000	36,000
3,570	4,000	71,000	39,000	28,000	6,750	8,000	113,000	69,000	36,000
3,600	4,000	71,000	39,000	28,000	6,800	8,000	113,000	69,000	36,000
3,700	4,000	71,000	39,000	28,000	6,900	8,000	113,000	69,000	36,000
3,800	4,000	75,000	43,000	28,000	7,000	8,000	113,000	69,000	36,000
3,900	4,000	75,000	43,000	28,000	7,100	8,000	113,000	69,000	36,000
3,970	4,000	75,000	43,000	28,000	7,140	8,000	113,000	69,000	36,000
4,000	4,000	75,000	43,000	28,000	7,200	8,000	113,000	69,000	36,000
4,100	6,000	87,000	43,000	36,000	7,300	8,000	113,000	69,000	36,000
4,200	6,000	87,000	43,000	36,000	7,400	8,000	113,000	69,000	36,000
4,300	6,000	91,000	47,000	36,000	7,500	8,000	113,000	69,000	36,000
4,370	6,000	91,000	47,000	36,000	7,540	8,000	119,000	75,000	36,000
4,400	6,000	91,000	47,000	36,000	7,550	8,000	119,000	75,000	36,000
4,500	6,000	91,000	47,000	36,000	7,600	8,000	119,000	75,000	36,000
4,600	6,000	91,000	47,000	36,000	7,700	8,000	119,000	75,000	36,000
4,650	6,000	91,000	47,000	36,000	7,800	8,000	119,000	75,000	36,000
4,700	6,000	91,000	47,000	36,000	7,900	8,000	119,000	75,000	36,000
4,760	6,000	96,000	52,000	36,000	7,940	8,000	119,000	75,000	36,000
4,800	6,000	96,000	52,000	36,000	8,000	8,000	119,000	75,000	36,000
4,900	6,000	96,000	52,000	36,000	8,100	10,000	125,000	75,000	40,000
5,000	6,000	96,000	52,000	36,000	8,200	10,000	125,000	75,000	40,000
5,100	6,000	96,000	52,000	36,000	8,300	10,000	125,000	75,000	40,000
5,160	6,000	96,000	52,000	36,000	8,330	10,000	125,000	75,000	40,000
5,200	6,000	96,000	52,000	36,000	8,400	10,000	125,000	75,000	40,000



Forets hélicoïd. à queue cylind. renforcée

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
8,500	10,000	125,000	75,000	40,000	10,800	12,000	151,000	94,000	45,000
8,600	10,000	131,000	81,000	40,000	10,900	12,000	151,000	94,000	45,000
8,700	10,000	131,000	81,000	40,000	11,000	12,000	151,000	94,000	45,000
8,730	10,000	131,000	81,000	40,000	11,100	12,000	151,000	94,000	45,000
8,800	10,000	131,000	81,000	40,000	11,110	12,000	151,000	94,000	45,000
8,900	10,000	131,000	81,000	40,000	11,200	12,000	151,000	94,000	45,000
9,000	10,000	131,000	81,000	40,000	11,300	12,000	151,000	94,000	45,000
9,100	10,000	131,000	81,000	40,000	11,400	12,000	151,000	94,000	45,000
9,130	10,000	131,000	81,000	40,000	11,500	12,000	151,000	94,000	45,000
9,200	10,000	131,000	81,000	40,000	11,510	12,000	151,000	94,000	45,000
9,300	10,000	131,000	81,000	40,000	11,600	12,000	151,000	94,000	45,000
9,400	10,000	131,000	81,000	40,000	11,700	12,000	151,000	94,000	45,000
9,500	10,000	131,000	81,000	40,000	11,800	12,000	151,000	94,000	45,000
9,520	10,000	137,000	87,000	40,000	11,900	12,000	158,000	101,000	45,000
9,550	10,000	137,000	87,000	40,000	11,910	12,000	158,000	101,000	45,000
9,600	10,000	137,000	87,000	40,000	12,000	12,000	158,000	101,000	45,000
9,700	10,000	137,000	87,000	40,000	12,100	14,000	161,000	101,000	45,000
9,800	10,000	137,000	87,000	40,000	12,200	14,000	161,000	101,000	45,000
9,900	10,000	137,000	87,000	40,000	12,300	14,000	161,000	101,000	45,000
9,920	10,000	137,000	87,000	40,000	12,400	14,000	161,000	101,000	45,000
10,000	10,000	137,000	87,000	40,000	12,500	14,000	161,000	101,000	45,000
10,100	12,000	144,000	87,000	45,000	12,600	14,000	161,000	101,000	45,000
10,200	12,000	144,000	87,000	45,000	12,700	14,000	161,000	101,000	45,000
10,300	12,000	144,000	87,000	45,000	12,800	14,000	161,000	101,000	45,000
10,320	12,000	144,000	87,000	45,000	12,900	14,000	161,000	101,000	45,000
10,400	12,000	144,000	87,000	45,000	13,000	14,000	161,000	101,000	45,000
10,500	12,000	144,000	87,000	45,000					
10,600	12,000	144,000	87,000	45,000					
10,700	12,000	151,000	94,000	45,000					
10,720	12,000	151,000	94,000	45,000					

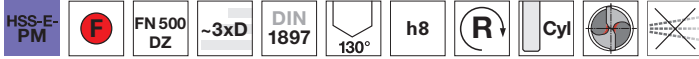


Forets hélicoïdaux extra-courts

N° d'article 84511

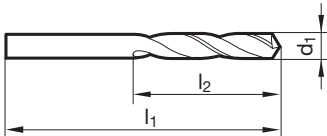


P	M	K	N	S	H
●	○	●	○	○	○



Amin. de l'âme $\geq \varnothing 1,000$ • affûtage à dépouille conique • acier PM HSS fritté et allié au Co • particulièrement rigide • résistance à l'usure particulièrement élevée

mat. haute résistance, aciers hautement alliés • aciers de cémentation et d'amélioration • fontes, laiton, bronzes



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	26,000	6,000	4,900	62,000	26,000
1,200	30,000	8,000	4,980	62,000	26,000
1,500	32,000	9,000	5,000	62,000	26,000
2,000	38,000	12,000	5,100	62,000	26,000
2,100	38,000	12,000	5,160	62,000	26,000
2,200	40,000	13,000	5,200	62,000	26,000
2,300	40,000	13,000	5,300	62,000	26,000
2,380	43,000	14,000	5,400	66,000	28,000
2,400	43,000	14,000	5,410	66,000	28,000
2,500	43,000	14,000	5,500	66,000	28,000
2,600	43,000	14,000	5,550	66,000	28,000
2,700	46,000	16,000	5,560	66,000	28,000
2,780	46,000	16,000	5,600	66,000	28,000
2,800	46,000	16,000	5,700	66,000	28,000
2,900	46,000	16,000	5,800	66,000	28,000
3,000	46,000	16,000	5,900	66,000	28,000
3,100	49,000	18,000	5,950	66,000	28,000
3,170	49,000	18,000	6,000	66,000	28,000
3,200	49,000	18,000	6,100	70,000	31,000
3,260	49,000	18,000	6,200	70,000	31,000
3,300	49,000	18,000	6,300	70,000	31,000
3,400	52,000	20,000	6,350	70,000	31,000
3,500	52,000	20,000	6,400	70,000	31,000
3,570	52,000	20,000	6,500	70,000	31,000
3,600	52,000	20,000	6,600	70,000	31,000
3,700	52,000	20,000	6,700	70,000	31,000
3,800	55,000	22,000	6,750	74,000	34,000
3,900	55,000	22,000	6,800	74,000	34,000
3,970	55,000	22,000	6,900	74,000	34,000
4,000	55,000	22,000	7,000	74,000	34,000
4,090	55,000	22,000	7,100	74,000	34,000
4,100	55,000	22,000	7,140	74,000	34,000
4,200	55,000	22,000	7,200	74,000	34,000
4,300	58,000	24,000	7,300	74,000	34,000
4,370	58,000	24,000	7,370	74,000	34,000
4,400	58,000	24,000	7,400	74,000	34,000
4,500	58,000	24,000	7,450	74,000	34,000
4,600	58,000	24,000	7,500	74,000	34,000
4,650	58,000	24,000	7,540	79,000	37,000
4,700	58,000	24,000	7,600	79,000	37,000
4,760	62,000	26,000	7,700	79,000	37,000
4,800	62,000	26,000	7,800	79,000	37,000



Forets hélicoïdaux extra-courts

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
7,900	79,000	37,000	9,700	89,000	43,000
7,940	79,000	37,000	9,800	89,000	43,000
8,000	79,000	37,000	9,900	89,000	43,000
8,100	79,000	37,000	9,920	89,000	43,000
8,200	79,000	37,000	10,000	89,000	43,000
8,300	79,000	37,000	10,200	89,000	43,000
8,330	79,000	37,000	10,320	89,000	43,000
8,400	79,000	37,000	10,500	89,000	43,000
8,500	79,000	37,000	10,720	95,000	47,000
8,600	84,000	40,000	11,000	95,000	47,000
8,700	84,000	40,000	11,110	95,000	47,000
8,730	84,000	40,000	11,500	95,000	47,000
8,800	84,000	40,000	11,510	95,000	47,000
8,900	84,000	40,000	11,800	95,000	47,000
9,000	84,000	40,000	11,910	102,000	51,000
9,100	84,000	40,000	12,000	102,000	51,000
9,130	84,000	40,000	12,300	102,000	51,000
9,200	84,000	40,000	12,500	102,000	51,000
9,300	84,000	40,000	12,700	102,000	51,000
9,350	84,000	40,000	13,000	102,000	51,000
9,400	84,000	40,000	13,500	107,000	54,000
9,500	84,000	40,000			
9,520	89,000	43,000			
9,600	89,000	43,000			

The background features a technical drawing of a bolt with various dimensions labeled: p , n/d , d_3 , d_2 , d_1 , A_1 , A_2 , and n_3 . The word "Bolzen" is also visible. In the foreground, a microscope and a pair of calipers are shown, both with their scales visible. The microscope scale ranges from 0 to 25, and the caliper scale ranges from 0 to 10. The entire image has a light green tint.

CONSEILS D'UTILISATION



Conseils d'utilisation pour FU500 | FN500

N° d'article

Norme/DIN

Matière de coupe

Version

Type

Le choix des outils dont les n° des gammes d'avance sont en caractères gras est à privilégier.

Ø outil mm	Gamme d'avance n°								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Produits de refroidissement:

- Air
- Huile
- Huile soluble

Sens de coupe:

- à droite

Matières	Exemples, nouvelle désignation (Ancienne désignation entre parenthèses) Caractères gras = N° de matières suivant DIN EN	Résistance MPa (N/mm ²)	Dureté	Prod. de réf.
Aciers de construction	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers de décolletage	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers d'amélioration non-alliés	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		<input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers d'amélioration alliés	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers de cémentation non-alliés	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		<input checked="" type="radio"/>
Aciers de cémentation alliés	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers de nitruration	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers à outils	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers rapides	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		<input checked="" type="radio"/>
Aciers à ressort	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	<input checked="" type="radio"/>
Aciers trempés	-		≤48 HRC ≤66 HRC	<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers inoxydables, sulfurés austénitiques martensitiques	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		<input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
Fontes	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	<input checked="" type="radio"/> <input checked="" type="radio"/>
Fontes à graphite sphéroïdal et fontes malléables	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	<input checked="" type="radio"/> <input checked="" type="radio"/>
Fontes dures	-		≤350 HB	<input checked="" type="radio"/>
Nouvelles fontes GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	<input checked="" type="radio"/> <input checked="" type="radio"/>
Nouvelles fontes ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Alliages spéciaux	Nimonic, Inconel, Monel, Hastelloy	≤2000		<input checked="" type="radio"/>
Titane et alliages de Titane	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aluminium et ses alliages	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="radio"/>
Alliages malléables d'Al	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		<input checked="" type="radio"/>
Alliages d'Al d'inject. ≤ 10 % Si ≤ 24 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="radio"/> <input checked="" type="radio"/>
Alliages de Magnésium	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		<input checked="" type="radio"/>
Cuivres, faiblement alliés	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		<input checked="" type="radio"/>
Laiton à copeaux courts, à copeaux longs	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="radio"/> <input checked="" type="radio"/>
Bronze, à copeaux courts	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		<input checked="" type="radio"/> <input checked="" type="radio"/>
Bronze, à copeaux longs	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		<input checked="" type="radio"/> <input checked="" type="radio"/>
Thermodurcissables	Résine époxy, Resopal, Pertinax, Moltopren	≤150		<input checked="" type="radio"/>
Thermoplastiques	Plexiglas, Hostalen, Novodur, Makralon	≤100		<input checked="" type="radio"/>
renf. de fibres d'aramides	Kevlar	≤1000		<input checked="" type="radio"/>
renf. de fibres de verre ou carbone	GFK/CFK	≤1000		<input checked="" type="radio"/>



HARTNER

≤3xD

84808
1897
HSS-E
○
FU500DZ

84805
WN
HSS-E
Ⓣ
FU500

84806
1897
HSS-E
Ⓣ
FU500DZ

84511
1897
HSS-E-PM
Ⓣ
FN500DZ

≤5xD

84804
338
HSS-E
○
FU500DZ

84802
338
HSS-E
Ⓣ
FU500DZ



v _c m/min	Gamme d'av. n°	v _c m/min	Gamme d'av. n°	v _c m/min	Gamme d'av. n°	v _c m/min	Gamme d'av. n°	v _c m/min	Gamme d'av. n°	v _c m/min	Gamme d'av. n°
35	6	45	6	45	6	42	6	35	6	45	6
30	5	35	5	35	5	37	5	30	5	35	5
40	6	50	6	50	6	47	7	40	6	50	6
30	6	40	6	40	6	44	6	30	6	40	6
32	6	44	6	44	6	47	6	32	6	44	6
28	6	44	6	44	6	47	6	28	6	44	6
20	5	40	5	40	5	44	5	20	5	40	5
15	4	27	4	27	4	30	4	15	4	27	4
13	3	22	3	22	3	25	3	13	3	22	3
30	6	44	6	44	6	47	4	30	6	44	6
16	4	22	4	22	4	25	5	16	4	22	4
12	3	18	3	18	3	20	4	12	3	18	3
15	4	22	4	22	4	25	5	15	4	22	4
10	3	16	3	16	3	18	4	10	3	16	3
15	4	20	4	20	4	22	5	15	4	20	4
10	3	15	3	15	3	17	4	10	3	15	3
10	3	13	3	13	3	17	4	10	3	13	3
		9	2	9	2	12	2			9	2
14	4	20	4	20	4	22	4	14	4	20	4
10	4	16	3	16	4	18	3	10	4	16	4
12	4	18	4	18	4	20	3	12	4	18	4
36	6	45	6	45	6	50	7	36	6	45	6
30	6	40	6	40	6	44	7	30	6	40	6
30	6	40	6	40	6	45	7	30	6	40	6
22	6	30	6	30	6	33	7	22	6	30	6
						16	4				
						6	2				
50	7	70	7	70	7			50	7	70	7
50	7	70	7	70	7			50	7	70	7
65	7	85	7	85	7			65	7	85	7
60	6	70	6	70	6			60	6	70	6
60	6	80	6	80	6			60	6	80	6
70	5	80	5	80	5			70	5	80	5
45	5	77	5	77	5	80	5	45	5	77	5
30	5	44	5	44	5	60	5	30	5	44	5
36	4	50	4	50	4	50	5	36	4	50	4
30	4	40	4	40	4	44	5	30	4	40	4
30	4	32	4	32	4	33	5	30	4	32	4
25	4	28	4	28	4	28	5	25	4	28	4
20	4	25	4	25	4	25	4	20	4	25	4
15	4	27	4	27	4			15	4	27	4



Conseils d'utilisation pour FU500 | FN500

N° d'article

Norme/DIN

Matière de coupe

Version

Type

Le choix des outils dont les n° des gammes d'avance sont en caractères gras est à privilégier.

Ø outil mm	Gamme d'avance n°								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Produits de refroidissement:

- Air
- Huile
- Huile soluble

Sens de coupe:

- à droite

Matières	Exemples, nouvelle désignation (Ancienne désignation entre parenthèses) Caractères gras = N° de matières suivant DIN EN	Résistance MPa (N/mm²)	Dureté	Prod. de réf.
Aciers de construction	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers de décolletage	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers d'amélioration non-alliés	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		<input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers d'amélioration alliés	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers de cémentation non-alliés	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		<input checked="" type="radio"/>
Aciers de cémentation alliés	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers de nitruration	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers à outils	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers rapides	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		<input checked="" type="radio"/>
Aciers à ressort	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	<input checked="" type="radio"/>
Aciers trempés	-		≤48 HRC ≤66 HRC	<input checked="" type="radio"/> <input checked="" type="radio"/>
Aciers inoxydables, sulfurés austénitiques martensitiques	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		<input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
Fontes	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	<input checked="" type="radio"/> <input checked="" type="radio"/>
Fontes à graphite sphéroïdal et fontes malléables	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMw-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	<input checked="" type="radio"/> <input checked="" type="radio"/>
Fontes dures	-		≤350 HB	<input checked="" type="radio"/>
Nouvelles fontes GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	<input checked="" type="radio"/> <input checked="" type="radio"/>
Nouvelles fontes ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Alliages spéciaux	Nimonic, Inconel, Monel, Hastelloy	≤2000		<input checked="" type="radio"/>
Titane et alliages de Titane	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		<input checked="" type="radio"/> <input checked="" type="radio"/>
Aluminium et ses alliages	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="radio"/>
Alliages malléables d'Al	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		<input checked="" type="radio"/>
Alliages d'Al d'inject. ≤ 10 % Si ≤ 24 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="radio"/> <input checked="" type="radio"/>
Alliages de Magnésium	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		<input checked="" type="radio"/>
Cuivres, faiblement alliés	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		<input checked="" type="radio"/>
Laiton à copeaux courts, à copeaux longs	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="radio"/> <input checked="" type="radio"/>
Bronze, à copeaux courts	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		<input checked="" type="radio"/> <input checked="" type="radio"/>
Bronze, à copeaux longs	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		<input checked="" type="radio"/> <input checked="" type="radio"/>
Thermodurcissables	Résine époxy, Resopal, Pertinax, Moltopren	≤150		<input checked="" type="radio"/>
Thermoplastiques	Plexiglas, Hostalen, Novodur, Makralon	≤100		<input checked="" type="radio"/>
renf. de fibres d'aramides	Kevlar	≤1000		<input checked="" type="radio"/>
renf. de fibres de verre ou carbone	GFK/CFK	≤1000		<input checked="" type="radio"/>



HARTNER

≤10xD

84801
WN
HSS-E
FU500

84811
338
HSS-E-PM
FN500DZ

84507
WN
HSS-E-PM
FN500

84814
340
HSS-E
FU500DZ

84812
340
HSS-E
FU500DZ



v_c m/min	Gamme d'av. n°	v_c m/min	Gamme d'av. n°	v_c m/min	Gamme d'av. n°	v_c m/min	Gamme d'av. n°	v_c m/min	Gamme d'av. n°
45	6	40	6	42	6	29	5	32	5
35	5	32	5	37	5	22	4	25	4
50	6	45	6	47	6	32	5	35	5
40	6	40	5	44	6	25	5	28	5
44	6	42	6	47	6	25	5	28	5
44	6	40	5	47	6	22	5	25	5
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27	4	25	4	30	4	12	3	13	3
22	3	20	3	25	3	11	2	12	2
44	6	40	4	47	3	25	5	28	5
22	4	22	4	25	4	12	3	14	3
18	3	18	3	20	3	11	2	12	2
22	4	20	4	25	4	12	3	13	3
16	3	15	3	18	4	7	2	8	2
20	4	21	4	22	5	12	3	13	9
15	3	16	3	17	4	9	2	10	2
13	3	15	3	14	4	9	2	10	2
9	2	12	2	12	2				
20	4	15	4	22	4	12	3	13	3
16	4	10	3	18	3	7	3	8	3
18	4	12	3	20	3	11	3	12	3
45	6	50	6	50	7	29	6	32	6
40	6	40	6	40	7	23	6	26	6
40	6	45	6	44	7	25	6	28	6
30	6	32	6	33	7	18	6	20	6
		8	3	16	4				
		5	2	6	2				
70	7					45	7	50	7
70	7					45	7	50	7
85	7					54	7	60	7
70	6					45	6	50	6
80	6					45	6	50	6
80	5	80	5	50	5	60	5	70	5
77	5					40	5	50	5
44	5	60	5	60	5	25	5	28	5
50	4	50	5	50	5	31	4	35	4
40	4	45	4	44	5	22	4	25	4
32	4	40	4	33	5	22	4	24	4
28	4	32	4	28	5	18	4	20	4
25	4	25	4	25	4	16	4	18	4
27	4					11	4	12	4

Notre programme:



FU 500/FN500



Forets de perçage pour forages profonds



Forets INOX



Multiplex



Microforets



Multiplex HPC



TS-Drills



Automate de gestion d'outils TM



Forets de taraudage



Fraises Haute Performance en CW



TF 100 Multi-Mill



Fraises à chanfreiner

Hartner GmbH

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