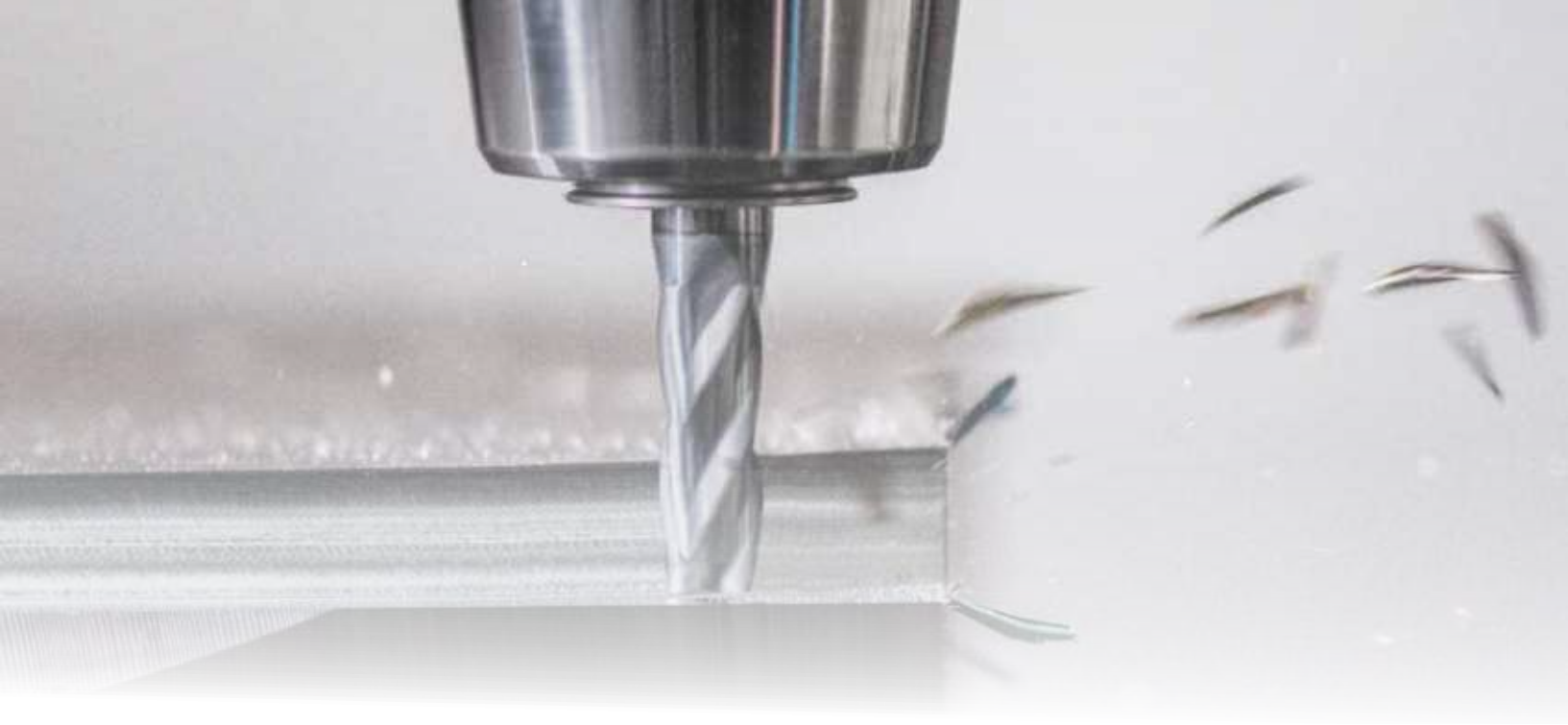


Solid carbide end mills



Solid Carbide End Mills Identification System

P Steel、Cast Iron	P20F	P20F Endmills for General Purpose ●Suitable for steels&cast iron(≤48HRC). ●High performance alcr series coating, high temperature resistance and high wear resistance. ●Variable helix angle and differential flute pitch,reduces vibration. ●Applicable to high efficiency machining of large cutting depth(ap) ●Adapt to several kinds of cooling conditions, for exanple oil mist,water,oil,air cooling.
M S Stainless Steel Titanium Alloys	M20F	M20F Endmills for General Machining of Stainless steel ●Suitable for general Machining of Stainless steel(≤280HB). ●Special edge design, effectively solve the crumbs. ●water cooling,,oil cooling IS the best cooling method.
N Aluminium Alloy	N25UF	N25UF Endmills for General Machining of Aluminum alloy ●Suitable for aluminum alloy(Si≤12%) and copper alloy(≤200HB)general processing. ●Special edge design, reduces vibration,effectively solve the crumbs. ●water cooling,,is the best cooling method.
N Graphite	NGK05A	NGK05A Endmills for Speed Machining of Graphite ●Special substrate with the perfect combination of diamond coating, superior wear resistance. ●Usitable for semi-finishing and finishing of graphite,apply for air cooling.
H High Hardened Material	H25UF	H25UF Endmills for Hardened steels(48-60HRC) ●High Hardeness,high toughness matrix materials, special angle design,special for hardened steels processing. ●For hardened steels(48-60HRC)finishing. ●Recommended to use air or oil mist cooling.

Code	Characteristic
1	Square End\Ballnose: a. Neck Length b. Flute Length 6-06 10-10
2	Cornor Radius: r0.2-02 r1-10
3	Miniature: a. Neck Length : 1-01 10-10 b. Flute Lengt (*10) : 0.8-08 1.6-16
4	Square End with Chamfer: C0.03-03 C0.13-13

①	②	③	④	⑤	⑥
P20F	S	B	4-	060	09

① End Profile	
S	Square
B	Ballnose
R	Cornor Radius
C	Square End with Chamfer

③ Length of Flute	
N	Reduce Neck
H	Long Shank
L	Long Flute
S	Short Flute
B	Double Helix
R	Rough Maching
	Blank: Standard

④ No. of Flutes
2
3
4

⑤ Diameter	
0.6mm	006
6mm	060
10mm	100

Guidelines to Icons

	Mark	Description
Shank	SHANK h6	ISO Standard Shank
Coating	AlCrN	AlCrN Coating
	AlCrSiN	AlCrSiN Coating
	AlTiN nano	Nano Coating AlTiN
	AlTiN/ TiSiN	Nano Coating AlTiN/TiSiN
	U-DIA	Ultra Fine Grain Diamond Coating

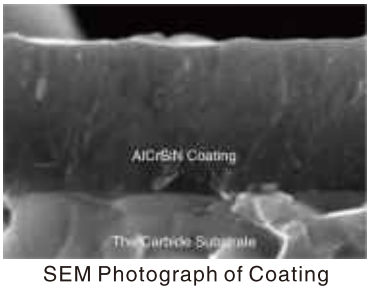
	Mark	Description
Endteeth Type	Square	Square End
	Corner-R	Corner Radius
	Ballnose	Ballnose
Cutting Condition		For Side Milling
		For Slotting
		For Profile Milling

	Mark	Description
Helix	30° Helix	30 ° Helix
	35° Helix	35 ° Helix
	35/38° Helix	Variable Helix
	45° Helix	45 ° Helix
No. of Flutes	2	2 Flute Endmills
	3	3 Flute Endmills
	4	4 Flute Endmills
	6	6 Flute Endmills

Universal High Performance Coating AlCrSiN

Characteristics and Function

- Productivity increase due to significantly higher cutting speed and feed for applications in a wide range of materials. Significantly enhanced productivity.
- Particular design of structure brings good balance between toughness, thermo–shock stability and residual stress.

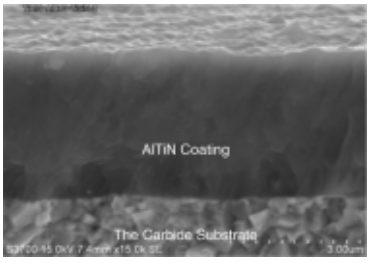


SEM Photograph of Coating

Nano Coating AlTiN

Characteristics and Function

- High aluminum content provides excellent hot hardness and oxidation resistance.
- Special method optimizes the structure of coating, significantly improvedstability, reducing the number of surface droplet.

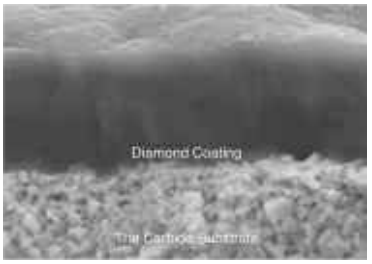


SEM Photograph of Coating

Ultra Fine Grain Diamond Coating

Characteristics and Function

- High purity diamond coating, with hardness up to 80GPa.
- Ultra smooth and shiny surface, low coefficient friction.
- Suitable for finish machining nonferrous materials,such as graphite,aluminium,carbon fiber,ceramic,etc.



Cross–section Image

Application Summary Of Solid Carbide Endmills

	ISO Material Group	General Machining	Roughing	High Efficiency Machining	High Speed Machining	Micro Machining
P	Carbon Steel,Alloy Steel (< 35HRC)	P20F	P20F	P20F		P20F
	Alloy Steel (35–48HRC)					
	PH,Ferritic,Martensitic Steel(< 35HRC)					
M	Stainless Steel	M20F	M20F			
K	Grey Cast Iron Nodular Cast Iron (< 32HRC)	P20F	P20F			P20F
	High–alloy Cast Iron (35–45HRC)					
N	Wrought Aluminium Alloys/Cast Aluminium Alloys(Si⩽12%)	N25UF			N25UF	
	Cast Aluminium Alloys (Si > 12%)					
	Copper Alloys (< 200HB)					
	Graphite Composite Material			NGK05A		
S	Heat–resistant Alloys (< 450HB)	M20F		M20F		
	Titanium Alloys (< 400HB)					
H	Hardened Steel (45–55HRC)	H25UF			H25UF	H25UF
	Hardened Steel (55–60HRC)					

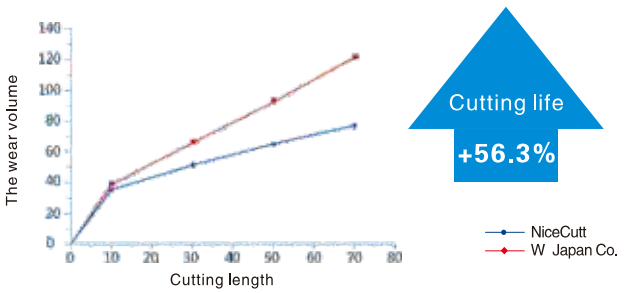
Case Study

Case 1:comparison of SKD61 cutting performance

Processing of common steel materials,W Japan Co. P20F series chip adhesion phenomenon,the edge state is still good.

Tool name	4 blade rounded head
Tool series	P20F
Specifications	D10*25*R0.5
Processing of materials	SKD61(40HRC)
Cutting speed	130m/min(4140RPM)
Feed speed	0.065mm/z(1076mm/min)
Cutting mode	Side milling
Cutting depth	ap=10mm,ae=1.2mm
Cooling mode	Air cooled
The use of equipment	Vertical machining center

The performance of NiceCutt tool is 56.3% higher than that of W Japan Co.



NiceCutt cutting 70m circumferential edge tool flank wear for 0.078mm, W Japan Co. has reached 0.122mm

NiceCutt	W Japan Co.
Milling of 10m	
A circular blade wear 0.036mm	A circular blade wear 0.039mm



NiceCutt	W Japan Co.
Milling of 50m	
A circular blade wear 0.065mm	A circular blade wear 0.093mm



NiceCutt	W Japan Co.
Milling of 70m	
A circular blade wear 0.078mm	A circular blade wear 0.122mm

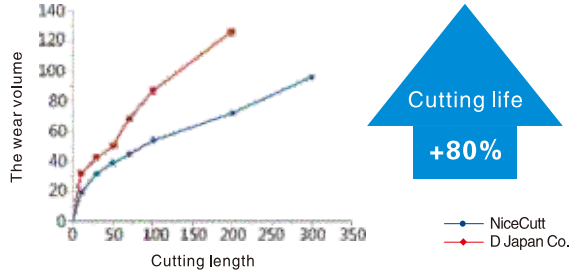


Case2:high hardened steel cutting performance test

High hardened steel material processing,achieve good wear resistance

Tool name	4 blade rounded head
Tool series	H25UF
Specifications	D8*20*R0.5
Processing of materials	SKD61(50HRC)
Cutting speed	120m/min(4777RPM)
Feed speed	0.04mm/z(764mm/min)
Cutting mode	Side milling
Cutting depth	ap=5.6mm,ae=0.64mm
Cooling mode	Air cooled
The use of equipment	Vertical machining center

The performance of NiceCutt tool is 80% higher than that of D Japan Co.



NiceCutt cutting 300m ,the circle edge and flank wear 0.096mm, D company cutting 200m,circumferential edge wear has reached 0.126mm

NiceCutt	D Japan Co.
Milling of 10m	
A circular blade wear 0.019mm	A circular blade wear 0.032mm



NiceCutt	D Japan Co.
Milling of 200m	
A circular blade wear 0.073mm	A circular blade wear 0.126mm



NiceCutt	D Japan Co.
Milling of 300m	
A circular blade wear 0.096mm	



Cannot use

P20F-S2/SH2

P M K



2 Flute
Standard Length

I007

P20F-S4/SH4

P M K



4 Flute
Standard Length

I008

P20F-SL4

P M K



4 Flute
Long Flute Length

I009

P20F-SR4

P M K



4 Flute
Rough Maching

I009

P20F-R2/RH2

P M K



2 Flute
Corner Radius

I010

P20F-R4/RH4

P M K



4 Flute
Corner Radius

I011

P20F-B2/BH2

P M K



2 Flute
Ballnose

I012

P20F-SB4

P M K



4 flute
double helix

I013

P20F-RB4

P M K



4 flute
corner radius,double helix

I013

H25UF-S4

H



4 flute
squre end

I014

H25UF-R4

H



4 Flute
Corner Radius

I015

H25UF-B2

H



2 Flute
Ballnose

I016

H25UF-SN2

H



2 flute
micro diameter
long necked,square end

I017

P20F-SN2

P M K



2 flute
micro diameter
long necked,square end

I017

H25UF-BN2

H



2 flute
micro diameter
long necked,ball nose

I018

P20F-BN2

P M K



2 flute
micro diameter
long necked,ball nose

I018

M20F-S2

M



2 Flute
Standard Length

I019

M20F-S4

M



4 Flute
Standard Length

I020

M20F-R2

M



2 Flute
Corner Radius

I021

M20F-R4

M



4 Flute
Corner Radius

I022

M20F-B2

M



2 Flute
Ballnose

I023

N25UF-S2/SH2

N



2 Flute
Standard Length

I024

N25UF-S3/SH3

N



3 Flute
Standard Length

I025

N25UF-SL2

N



2 Flute
Long Flute Length

I026

N25UF-SL3

N



3 Flute
Long Flute Length

I026

N25UF-R2

N



2 Flute
Corner Radius

I027

N25UF-RH2

N



2 Flute
Corner Radius

I028

N25UF-R3

N



3 Flute
Corner Radius

I029

N25UF-RH3

N



3 Flute
Corner Radius

I030

N25UF-B2

N

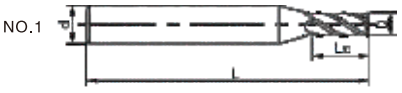


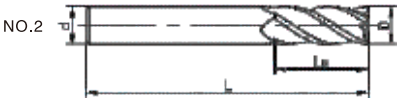
2 Flute
Ballnose

I031

P20F 2 Flute,Standard Length









HRC32–48

Standard shank

Ordering Code	Stock	D	Lc	L	d	Figure No.
P20F–S2–02006	●	2	6	50	4	1
P20F–S2–03009	●	3	9		4	
P20F–S2–63009	●	3	9		6	
P20F–S2–04011	●	4	11		4	2
P20F–S2–64011	●	4	11		6	1
P20F–S2–05013	●	5	13		6	
P20F–S2–06016	●	6	16		6	2
P20F–S2–08020	●	8	20	60	8	
P20F–S2–10025	●	10	25	75	10	
P20F–S2–12030	●	12	30		12	
P20F–S2–16036	●	16	36	100	16	
P20F–S2–20045	●	20	45		20	

Long shank

Ordering Code	Stock	D	Lc	L	d	Figure No.
P20F–SH2–02006	●	2	6	75	4	1
P20F–SH2–03009	●	3	9		4	
P20F–SH2–63009	●	3	9		6	
P20F–SH2–04011	●	4	11		4	2
P20F–SH2–64011	●	4	11		6	1
P20F–SH2–05013	●	5	13		6	
P20F–SH2–06016	●	6	16		6	2
P20F–SH2–08020	●	8	20	75	8	
P20F–SH2–10025	●	10	25	100	10	
P20F–SH2–12030	●	12	30		12	
P20F–SH2–16036	●	16	36	150	16	
P20F–SH2–20045	●	20	45		20	

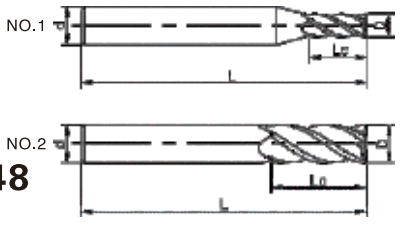
●Stock ○Availabie upon Order

P20F 4 Flute,Square End





HRC32-48



Standard shank

Ordering Code	Stock	D	Lc	L	d	Figure No.
P20F-S4-03009	●	3	9	50	4	1
P20F-S4-04011	●	4	11			2
P20F-S4-05013	●	5	13		6	1
P20F-S4-06016	●	6	16			2
P20F-S4-08020	●	8	20	60	8	
P20F-S4-10025	●	10	25	75	10	
P20F-S4-12030	●	12	30		12	
P20F-S4-16036	●	16	36	100	16	
P20F-S4-20045	●	20	45		20	

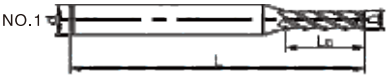
Long shank

Ordering Code	Stock	D	Lc	L	d	Figure No.
P20F-SH4-03009	●	3	9	75	4	1
P20F-SH4-04011	●	4	11			2
P20F-SH4-05013	●	5	13		6	1
P20F-SH4-06016	●	6	16			2
P20F-SH4-08020	●	8	20	75	8	
P20F-SH4-10025	●	10	25	100	10	
P20F-SH4-12030	●	12	30		12	
P20F-SH4-16036	●	16	36	150	16	
P20F-SH4-20045	●	20	45		20	

●Stock ○Availabie upon Order

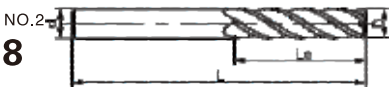
P20F 4 Flute,Long Flute Length,Square End







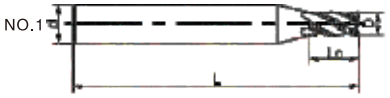
HRC32–48



Ordering Code	Stock	D	Lc	L	d	Figure No.
P20F–SL4–02010	●	2	10	50	4	1
P20F–SL4–03015	●	3	15	60		
P20F–SL4–04020	●	4	20			2
P20F–SL4–63015	●	3	15		6	1
P20F–SL4–64020	●	4	20	75		
P20F–SL4–05025	●	5	25			
P20F–SL4–06030	●	6	30			2
P20F–SL4–08035	●	8	35	100	8	
P20F–SL4–10045	●	10	45		10	
P20F–SL4–12045	●	12	45		12	
P20F–SL4–14045	●	14	45		16	1
P20F–SL4–16060	●	16	60	150		2
P20F–SL4–18070	●	18	70		18	
P20F–SL4–20070	●	20	70		20	

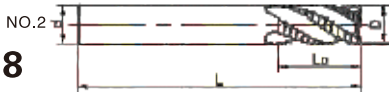
P20F 4 Flute Square End,for Rough Maching







HRC32–48

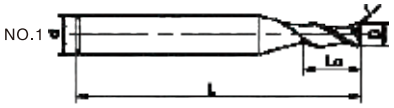


Ordering Code	Stock	D	Lc	L	d	Figure No.
P20F–SR4–06015	●	6	15	50	6	2
P20F–SR4–08020	●	8	20	60	8	
P20F–SR4–10025	●	10	25	75	10	
P20F–SR4–12030	●	12	30		12	
P20F–SR4–16036	●	16	36	100	16	
P20F–SR4–20045	●	20	45		20	

●Stock ○Availabie upon Order

P20F 2 Flute,Corner Radius







HRC32–48

Standard shank

Ordering Code	Stock	D	Lc	r	L	d	Figure No.
P20F–R2–03005	●	3	9	0.5	50	4	1
P20F–R2–04005	●	4	11	0.5			2
P20F–R2–04010	●			1			
P20F–R2–06005	●	6	16	0.5		6	
P20F–R2–06010	●			1			
P20F–R2–06015	●			1.5			
P20F–R2–08005	●	8	20	0.5	60	8	
P20F–R2–08010	●			1			
P20F–R2–08015	●			1.5			
P20F–R2–10005	●	10	25	0.5	75	10	
P20F–R2–10010	●			1			
P20F–R2–10015	●			1.5			
P20F–R2–10020	●			2			
P20F–R2–12005	●	12	30	0.5		12	
P20F–R2–12010	●			1			
P20F–R2–12015	●			1.5			
P20F–R2–12020	●			2			
P20F–R2–12030	●			3			
P20F–R2–16005	●	16	36	0.5	100	16	
P20F–R2–16010	●			1			
P20F–R2–16020	●			2			
P20F–R2–16030	●			3			

Long shank

Ordering Code	Stock	D	Lc	r	L	d	Figure No.
P20F–RH2–06005	●	6	16	0.5	75	6	2
P20F–RH2–06010	●			1			
P20F–RH2–06015	●			1.5			
P20F–RH2–08005	●	8	20	0.5	100	8	
P20F–RH2–08010	●			1			
P20F–RH2–08015	●			1.5			
P20F–RH2–10005	●	10	25	0.5	100	10	
P20F–RH2–10010	●			1			
P20F–RH2–10015	●			1.5			
P20F–RH2–10020	●			2			
P20F–RH2–12005	●	12	30	0.5		12	
P20F–RH2–12010	●			1			
P20F–RH2–12015	●			1.5			
P20F–RH2–12020	●			2			
P20F–RH2–16005	●	16	36	0.5	150	16	
P20F–RH2–16010	●			1			
P20F–RH2–16020	●			2			
P20F–RH2–16030	●			3			

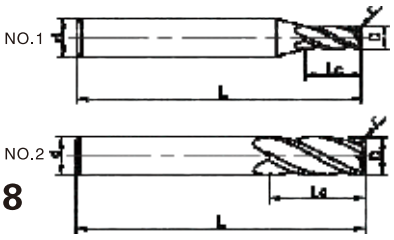
●Stock ○Availabie upon Order

P20F 4 Flute,Corner Radius





HRC32–48



Standard shank

Ordering Code	Stock	D	Lc	r	L	d	Figure No.
P20F–R4–04005	●	4	11	0.5	50	4	2
P20F–R4–04010	●			1			
P20F–R4–06005	●	6	16	0.5		6	
P20F–R4–06010	●			1			
P20F–R4–06015	●			1.5			
P20F–R4–08005	●	8	20	0.5	60	8	
P20F–R4–08010	●			1			
P20F–R4–08015	●			1.5			
P20F–R4–08020	●			2			
P20F–R4–10005	●	10	25	0.5	75	10	
P20F–R4–10010	●			1			
P20F–R4–10015	●			1.5			
P20F–R4–10020	●			2			
P20F–R4–12005	●	12	30	0.5		12	
P20F–R4–12010	●			1			
P20F–R4–12015	●			1.5			
P20F–R4–12020	●			2			
P20F–R4–12030	●			3			
P20F–R4–16005	●	16	36	0.5	100	16	
P20F–R4–16010	●			1			
P20F–R4–16020	●			2			
P20F–R4–16030	●			3			

Long shank

Ordering Code	Stock	D	Lc	r	L	d	Figure No.
P20F–RH4–06005	●	6	16	0.5	75	6	2
P20F–RH4–06010	●			1			
P20F–RH4–08005	●	8	20	0.5	100	8	
P20F–RH4–08010	●			1			
P20F–RH4–08015	●			1.5			
P20F–RH4–08020	●			2			
P20F–RH4–10005	●	10	25	0.5	100	10	
P20F–RH4–10010	●			1			
P20F–RH4–10015	●			1.5			
P20F–RH4–10020	●			2			
P20F–RH4–12005	●	12	30	0.5		12	
P20F–RH4–12010	●			1			
P20F–RH4–12015	●			1.5			
P20F–RH4–12020	●			2			
P20F–RH4–12030	●			3			
P20F–RH4–16005	●	16	36	0.5	150	16	
P20F–RH4–16010	●			1			
P20F–RH4–16020	●			2			
P20F–RH4–16030	●			3			

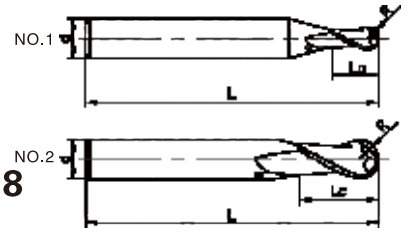
●Stock ○Availabie upon Order

P20F 2 Flute Ballnose





HRC32–48



Standard shank

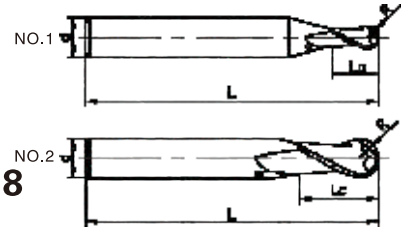
Ordering Code	Stock	D	R	Lc	L	d	Figure No.
P20F–B2–04008	●	4	2	8	50	4	2
P20F–B2–06012	●	6	3	12		6	
P20F–B2–08014	●	8	4	14	60	8	
P20F–B2–10018	●	10	5	18	75	10	
P20F–B2–12022	●	12	6	22		12	

P20F 2 Flute Ballnose





HRC32–48



Long shank

Ordering Code	Stock	D	R	Lc	L	d	Figure No.
P20F–BH2–02004	●	2	1	4	75	4	1
P20F–BH2–03006	●	3	1.5	6			
P20F–BH2–04008	●	4	2	8			2
P20F–BH2–63006	●	3	1.5	6		6	1
P20F–BH2–64008	●	4	2	8			
P20F–BH2–05010	●	5	2.5	10			
P20F–BH2–06012	●	6	3	12			2
P20F–BH2–08014	●	8	4	14	100	8	
P20F–BH2–10018	●	10	5	18		10	
P20F–BH2–12022	●	12	6	22		12	

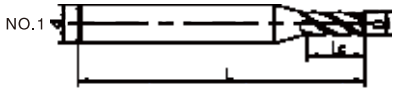
●Stock ○Availabie upon Order

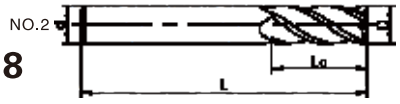
P20F 4 flute,squre end,double helix





HRC32–48





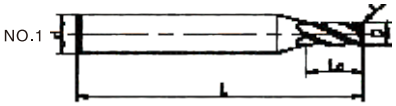
Ordering Code	Stock	D	Lc	L	d	Figure No.
P20F–SB4–03009	●	3	9	50	4	1
P20F–SB4–04011	●	4	11			2
P20F–SB4–05013	●	5	13		6	1
P20F–SB4–06016	●	6	16			2
P20F–SB4–08020	●	8	20	60	8	
P20F–SB4–10025	●	10	25	75	10	
P20F–SB4–12030	●	12	30		12	
P20F–SB4–16036	●	16	36	100	16	
P20F–SB4–20045	●	20	45		20	

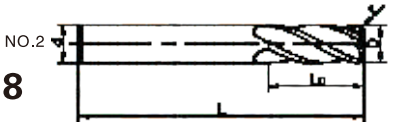
P20F 4 flute,corner radius,double helix





HRC32–48





Ordering Code	Stock	D	Lc	r	L	d	Figure No.
P20F–RB4–04005	●	4	11	0.5	50	4	2
P20F–RB4–06005	●	6	16	0.5		6	
P20F–RB4–06010	●			1.0			
P20F–RB4–06015	●			1.5			
P20F–RB4–08005	●	8	20	0.5	60	8	
P20F–RB4–08010	●			1.0			
P20F–RB4–08015	●			1.5			
P20F–RB4–08020	●			2.0			
P20F–RB4–10005	●	10	25	0.5	75	10	
P20F–RB4–10010	●			1.0			
P20F–RB4–10015	●			1.5			
P20F–RB4–10020	●			2.0			
P20F–RB4–12005	●	12	30	0.5		12	
P20F–RB4–12010	●			1.0			
P20F–RB4–12015	●			1.5			
P20F–RB4–12020	●			2.0			
P20F–RB4–12030	●			3.0			
P20F–RB4–16020	●	16	36	2.0	100	16	

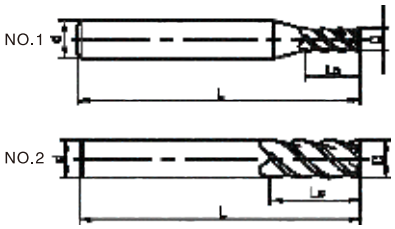
●Stock ○Availabie upon Order

H25UF 4 flute,squre end





HRC45–60



Ordering Code	Stock	D	Lc	L	d	Figure No.
H25UF–S4–03009	●	3	9	50	4	1
H25UF–S4–04010	●	4	10			2
H25UF–S4–06015	●	6	15		6	
H25UF–S4–08020	●	8	20	60	8	
H25UF–S4–10025	●	10	25	75	10	
H25UF–S4–12030	●	12	30		12	
H25UF–S4–16036	●	16	36	100	16	
H25UF–S4–20045	●	20	45		20	

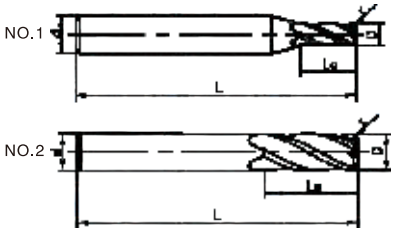
●Stock ○Availabie upon Order

H25UF 4 flute,corner radius





HRC45–60



Ordering Code	Stock	D	Lc	r	L	d	Figure No.
H25UF-R4-03003	●	3	9	0.3	50	4	1
H25UF-R4-03005	●			0.5			2
H25UF-R4-04005	●	4	10	0.5			
H25UF-R4-04010	●			1		6	
H25UF-R4-06005	●	6	15	0.5	60		
H25UF-R4-06010	●			1		8	
H25UF-R4-08005	●	8	20	0.5			
H25UF-R4-08010	●			1		10	
H25UF-R4-10005	●	10	25	0.5	75		
H25UF-R4-10010	●			1			
H25UF-R4-10015	●			1.5			
H25UF-R4-10020	●			2		12	
H25UF-R4-12005	●	12	30	0.5			
H25UF-R4-12010	●			1			
H25UF-R4-12015	●			1.5			
H25UF-R4-12020	●			2			

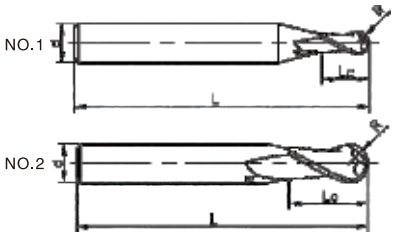
●Stock ○Availabie upon Order

H25UF 2 flute ballnose





HRC45–60

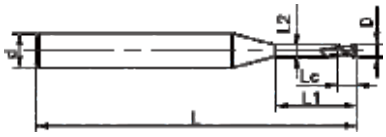


Ordering Code	Stock	D	R	Lc	L	d	Figure No.
H25UF-B2-02004	●	2	1	4	50	4	1
H25UF-B2-03006	●	3	1.5	6			2
H25UF-B2-04008	●	4	2	8			
H25UF-B2-06012	●	6	3	12		6	
H25UF-B2-08014	●	8	4	14	60	8	
H25UF-B2-10018	●	10	5	18	75	10	
H25UF-B2-12022	●	12	6	22		12	
H25UF-B2-16026	●	16	8	26	100	16	

●Stock ○Availabie upon Order

H25UF 2 flute,micro diameter,long necked,square end





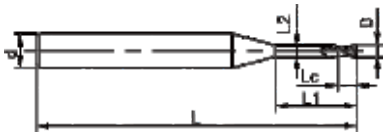


HRC45–60

Ordering Code	Stock	D	Lc	d2	L1	L	d
H25UF-SN2-00401	●	0.4	0.6	0.36	1	50	4
H25UF-SN2-00402	●				2		
H25UF-SN2-00404	●				4		
H25UF-SN2-00602	●	0.6	0.8	0.56	2		
H25UF-SN2-00604	●				4		
H25UF-SN2-00606	●				6		
H25UF-SN2-00802	●	0.8	1.2	0.75	2		
H25UF-SN2-00804	●				4		
H25UF-SN2-00806	●				6		
H25UF-SN2-01006	●	1	1.5	0.95	6		
H25UF-SN2-01008	●				8		
H25UF-SN2-01010	●				10		
H25UF-SN2-01508	●	1.5	2	1.44	8		
H25UF-SN2-01510	●				10		
H25UF-SN2-01512	●				12		
H25UF-SN2-02008	●	2	3	1.92	8		
H25UF-SN2-02010	●				10		
H25UF-SN2-02012	●				12		

P20F 2 flute,micro diameter,long necked,square end







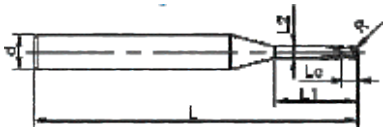
HRC35–48

Ordering Code	Stock	D	Lc	d2	L1	L	d
P20F-SN2-00802	●	0.8	1.2	0.75	2	50	4
P20F-SN2-00804	●				4		
P20F-SN2-00806	●				6		
P20F-SN2-01006	●	1	1.5	0.95	6		
P20F-SN2-01008	●				8		
P20F-SN2-01010	●				10		
P20F-SN2-01508	●	1.5	2	1.44	8		
P20F-SN2-01510	●				10		
P20F-SN2-01512	●				12		
P20F-SN2-02008	●	2	3	1.92	8		
P20F-SN2-02010	●				10		
P20F-SN2-02012	●				12		

●Stock ○Availabie upon Order

H25UF 2 flute,micro diameter,long necked,ball nose





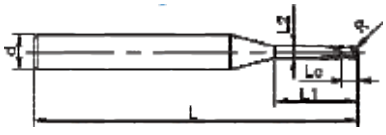


HRC45–60

Ordering Code	Stock	D	r	Lc	d2	L1	L
H25UF–BN2–00401	●	0.4	0.2	0.3	0.35	1	50
H25UF–BN2–00402	●					2	
H25UF–BN2–00403	●					3	
H25UF–BN2–00601	●	0.6	0.3	0.4	0.55	1	
H25UF–BN2–00602	●					2	
H25UF–BN2–00603	●					3	
H25UF–BN2–00802	●	0.8	0.4	0.6	0.75	2	
H25UF–BN2–00804	●					4	
H25UF–BN2–00806	●					6	
H25UF–BN2–01006	●	1	0.5	0.8	0.95	6	
H25UF–BN2–01008	●					8	
H25UF–BN2–01010	●					10	
H25UF–BN2–01206	●	1.2	0.6	1	1.15	6	
H25UF–BN2–01208	●					8	
H25UF–BN2–01210	●					10	
H25UF–BN2–01508	●	1.5	0.75	1.4	1.44	8	
H25UF–BN2–01510	●					10	
H25UF–BN2–01512	●					12	
H25UF–BN2–02008	●	2	1	1.6	1.92	8	
H25UF–BN2–02010	●					10	
H25UF–BN2–02012	●					12	

P20F 2 flute,micro diameter,long necked,ball nose







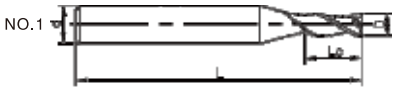
HRC35–48

Ordering Code	Stock	D	r	Lc	d2	L1	L
P20F–BN2–00802	●	0.8	0.4	0.6	0.75	2	50
P20F–BN2–00804	●					4	
P20F–BN2–00806	●					6	
P20F–BN2–01006	●	1	0.5	0.8	0.95	6	
P20F–BN2–01008	●					8	
P20F–BN2–01010	●					10	
P20F–BN2–01206	●	1.2	0.6	1	1.15	6	
P20F–BN2–01208	●					8	
P20F–BN2–01210	●					10	
P20F–BN2–01508	●	1.5	0.75	1.4	1.44	8	
P20F–BN2–01510	●					10	
P20F–BN2–01512	●					12	
P20F–BN2–02008	●	2	1	1.6	1.92	8	
P20F–BN2–02010	●					10	
P20F–BN2–02012	●					12	

●Stock ○Availabie upon Order

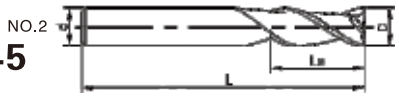
M20F 2 flute standard length,square end







HRC25–45



Ordering Code	Stock	D	Lc	L	d	Figure No.
M20F–S2–00501	●	0.5	1	50	4	1
M20F–S2–00802	●	0.8	2			
M20F–S2–01003	●	1	3			
M20F–S2–01504	●	1.5	4			
M20F–S2–02006	●	2	6			
M20F–S2–02508	●	2.5	8			
M20F–S2–63008	●	3	8		6	
M20F–S2–03009	●	3	9		4	
M20F–S2–03510	●	3.5	10			
M20F–S2–04011	●	4	11			2
M20F–S2–64011	●	4	11		6	1
M20F–S2–05013	●	5	13			
M20F–S2–06016	●	6	16			2
M20F–S2–08020	●	8	20	60	8	
M20F–S2–10025	●	10	25	75	10	
M20F–S2–12030	●	12	30		12	
M20F–S2–16036	●	16	36	100	16	
M20F–S2–20045	●	20	45		20	

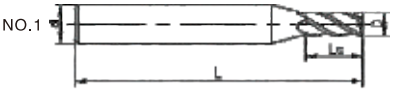
●Stock ○Availabie upon Order

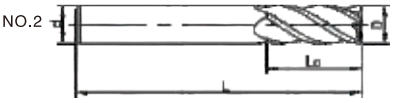
M20F 4 flute standard length,square end





HRC25–45





Ordering Code	Stock	D	Lc	L	d	Figure No.
M20F–S4–01003	●	1	3	50	4	1
M20F–S4–01504	●	1.5	4			
M20F–S4–02006	●	2	6			
M20F–S4–02508	●	2.5	8			
M20F–S4–63008	●	3	8		6	
M20F–S4–03009	●	3	9		4	
M20F–S4–04011	●	4	11			2
M20F–S4–64011	●	4	11		6	1
M20F–S4–05013	●	5	13			
M20F–S4–06016	●	6	16			2
M20F–S4–08020	●	8	20	60	8	
M20F–S4–10025	●	10	25	75	10	
M20F–S4–12030	●	12	30		12	
M20F–S4–16036	●	16	36	100	16	
M20F–S4–20045	●	20	45		20	

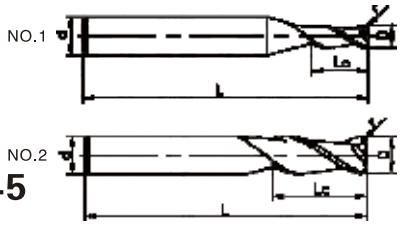
●Stock ○Availabie upon Order

M20F 2 flute,corner radius





HRC25–45



Ordering Code	Stock	D	Lc	r	L	d	Figure No.
M20F–R2–03003	●	3	9	0.3	50	4	1
M20F–R2–03005	●			0.5			
M20F–R2–04002	●	4	11	0.2			2
M20F–R2–64002	●					6	1
M20F–R2–04003	●			0.3		4	2
M20F–R2–64003	●					6	
M20F–R2–64005	●			0.5			1
M20F–R2–05002	●	5	13	0.2			
M20F–R2–05003	●			0.3			
M20F–R2–05005	●			0.5			
M20F–R2–06002	●	6	16	0.2			2
M20F–R2–06003	●			0.3			
M20F–R2–06005	●			0.5			
M20F–R2–08005	●	8	20		60	8	
M20F–R2–08010	●			1			
M20F–R2–10005	●	10	25	0.5	75	10	
M20F–R2–10010	●			1			
M20F–R2–10015	●			1.5			
M20F–R2–12005	●	12	30	0.5		12	
M20F–R2–12010	●			1			
M20F–R2–12015	●			1.5			
M20F–R2–16005	●	16	36	0.5	100	16	
M20F–R2–16010	●			1			
M20F–R2–16020	●			2			
M20F–R2–16030	●			3			

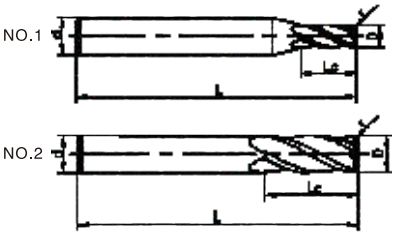
●Stock ○Availabie upon Order

M20F 4 flute,corner radius





HRC25–45



Ordering Code	Stock	D	Lc	r	L	d	Figure No.
M20F–R4–02002	●	2	6	0.2	50	4	1
M20F–R4–03003	●	3	9	0.3			
M20F–R4–64002	●	4	11	0.2		6	
M20F–R4–64003	●			0.3			
M20F–R4–04003	●					4	2
M20F–R4–05005	●	5	13	0.5		6	1
M20F–R4–06005	●	6	16				2
M20F–R4–08002	●	8	20	0.2	60	8	
M20F–R4–68005	●			0.5			
M20F–R4–10005	●	10	25		75	10	
M20F–R4–10010	●			1			
M20F–R4–12010	●	12	30			12	
M20F–R4–16010	●	16	36		100	16	
M20F–R4–20010	●	20	45			20	

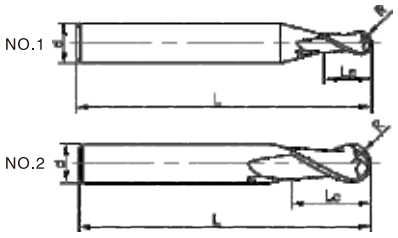
●Stock ○Availabie upon Order

M20F 2 flute,ball nose





HRC25–45



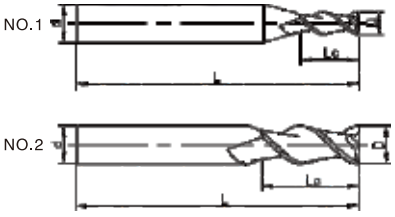
Ordering Code	Stock	D	R	Lc	L	d	Figure No.
M20F–B2–01002	●	1	0.5	2	50	4	1
M20F–B2–01503	●	1.5	0.75	3			
M20F–B2–02004	●	2	1	4			
M20F–B2–03006	●	3	1.5	6			
M20F–B2–63006	●					6	
M20F–B2–04008	●	4	2	8		4	2
M20F–B2–64008	●					6	1
M20F–B2–05010	●	5	2.5	10			
M20F–B2–06012	●	6	3	12			2
M20F–B2–08014	●	8	4	14	60	8	
M20F–B2–10018	●	10	5	18	75	10	
M20F–B2–12022	●	12	6	22		12	
M20F–B2–16026	●	16	8	26	100	16	
M20F–B2–20038	●	20	10	38		20	

●Stock ○Availabie upon Order

N25UF 2 flute,corner radius







Standard shank

Ordering Code	Stock	D	Lc	L	d	Figure No.
N25UF-S2-01003	○	1	3	50	4	1
N25UF-S2-02006	○	2	6			
N25UF-S2-03009	○	3	9			
N25UF-S2-63009	○				6	
N25UF-S2-04011	○	4	11		4	2
N25UF-S2-64011	○				6	1
N25UF-S2-05013	○	5	13			
N25UF-S2-06016	○	6	16			2
N25UF-S2-07020	○	7	20	60	8	1
N25UF-S2-08020	○	8	20			2
N25UF-S2-09023	○	9	23	75	10	1
N25UF-S2-10025	○	10	25			2
N25UF-S2-12030	○	12	30		12	
N25UF-S2-16036	○	16	36	100	16	
N25UF-S2-20045	○	20	45		20	

Long shank

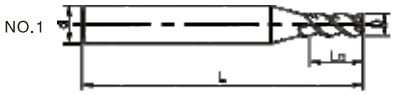
Ordering Code	Stock	D	Lc	L	d	Figure No.
N25UF-SH2-02006	○	2	6	75	4	1
N25UF-SH2-03009	○	3	9			
N25UF-SH2-04010	○	4	10			2
N25UF-SH2-06015	○	6	15		6	
N25UF-SH2-08020	○	8	20	100	8	
N25UF-SH2-10025	○	10	25		10	
N25UF-SH2-12030	○	12	30		12	
N25UF-SH2-16036	○	16	36	150	16	
N25UF-SH2-20045	○	20	45		20	

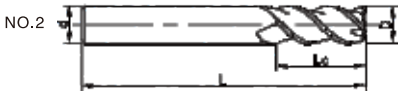
●Stock ○Availabie upon Order

N25UF 3 flute,square end









Standard shank

Ordering Code	Stock	D	Lc	L	d	Figure No.
N25UF-S3-02006	●	2	6	50	4	1
N25UF-S3-03009	●	3	9			
N25UF-S3-04011	●	4	11			2
N25UF-S3-05013	●	5	13		6	1
N25UF-S3-06016	●	6	16			2
N25UF-S3-07020	●	7	20	60	8	1
N25UF-S3-08020	●	8	20			2
N25UF-S3-09023	●	9	23	75	10	1
N25UF-S3-10025	●	10	25			2
N25UF-S3-12030	●	12	30		12	
N25UF-S3-16036	●	16	36	100	16	
N25UF-S3-18038	●	18	38		18	
N25UF-S3-20045	●	20	45		20	

Long shank

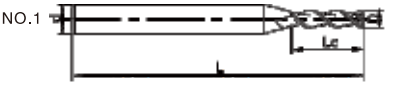
Ordering Code	Stock	D	Lc	L	d	Figure No.
N25UF-SH3-02008	●	2	8	75	4	1
N25UF-SH3-03010	●	3	10			
N25UF-SH3-04012	●	4	12			2
N25UF-SH3-05014	●	5	14		6	1
N25UF-SH3-06016	●	6	16			2
N25UF-SH3-08020	●	8	20	100	8	
N25UF-SH3-10025	●	10	25		10	
N25UF-SH3-12030	●	12	30		12	
N25UF-SH3-16036	●	16	36	150	16	
N25UF-SH3-20043	●	20	43		20	

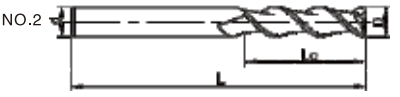
●Stock ○Availabie upon Order

N25UF 2 flute,long flute length,square end







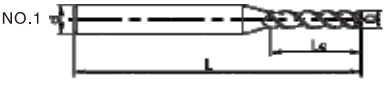


Ordering Code	Stock	D	Lc	L	d	Figure No.
N25UF-SL2-02020	○	2	20	75	4	1
N25UF-SL2-03025	○	3	25			
N25UF-SL2-04030	○	4	30			2
N25UF-SL2-05030	○	5	30		6	1
N25UF-SL2-06035	○	6	35			2
N25UF-SL2-08040	○	8	40	100	8	
N25UF-SL2-10045	○	10	45		10	
N25UF-SL2-12050	○	12	50		12	
N25UF-SL2-16060	○	16	60	150	16	
N25UF-SL2-20070	○	20	70		20	

N25UF 3 flute,long flute length,square end









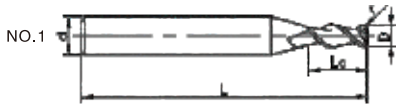
Ordering Code	Stock	D	Lc	L	d	Figure No.
N25UF-SL3-02020	○	2	20	75	4	1
N25UF-SL3-03025	○	3	25			
N25UF-SL3-04030	○	4	30			2
N25UF-SL3-05030	○	5	30		6	1
N25UF-SL3-06035	○	6	35			2
N25UF-SL3-08040	○	8	40	100	8	
N25UF-SL3-10045	○	10	45		10	
N25UF-SL3-12050	○	12	50		12	
N25UF-SL3-16060	○	16	60	150	16	
N25UF-SL3-20070	○	20	70		20	

●Stock ○Availabie upon Order

N25UF 2 flute,corner radius





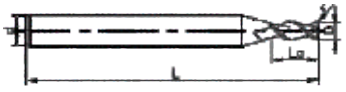


Ordering Code	Stock	D	Lc	r	L	d	Figure No.
N25UF-R2-01001	○	1	3	0.1	50	4	1
N25UF-R2-02002	○	2	6	0.2			
N25UF-R2-03002	○	3	9				
N25UF-R2-03003	○			0.3			
N25UF-R2-63003	○					6	
N25UF-R2-03005	○			0.5		4	
N25UF-R2-63005	○					6	
N25UF-R2-04002	○	4	11	0.2		4	2
N25UF-R2-04003	○			0.3			
N25UF-R2-64003	○					6	1
N25UF-R2-04005	○			0.5		4	2
N25UF-R2-64005	○					6	1
N25UF-R2-04010	○			1		4	2
N25UF-R2-05002	○	5	13	0.2		6	1
N25UF-R2-05003	○			0.2			
N25UF-R2-05005	○			0.5			
N25UF-R2-05010	○			1			
N25UF-R2-05015	○			1.5			
N25UF-R2-06005	○	6	16	0.5			2
N25UF-R2-06010	○			1			
N25UF-R2-06015	○			1.5			
N25UF-R2-06020	○			2			
N25UF-R2-08005	○			0.5			
N25UF-R2-08010	○	8	20	1	60	8	
N25UF-R2-08015	○			1.5			
N25UF-R2-08020	○			2			
N25UF-R2-10005	○			0.5			
N25UF-R2-10010	○	10	25	1	75	10	
N25UF-R2-10015	○			1.5			
N25UF-R2-10020	○			2			
N25UF-R2-10025	○			2.5			
N25UF-R2-12005	○	12	30	0.5		12	
N25UF-R2-12010	○			1			
N25UF-R2-12015	○			1.5			
N25UF-R2-12020	○			2			
N25UF-R2-12025	○			2.5			
N25UF-R2-16005	○	16	36	0.5	100	16	
N25UF-R2-16010	○			1			
N25UF-R2-16015	○			1.5			
N25UF-R2-16020	○			2			
N25UF-R2-16025	○			2.5			
N25UF-R2-20005	○	20	45	0.5		20	
N25UF-R2-20010	○			1			
N25UF-R2-20015	○			1.5			
N25UF-R2-20020	○			2			
N25UF-R2-20030	○			3			

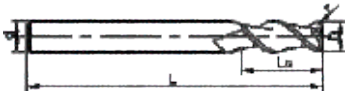
●Stock ○Availabie upon Order

N25UF 2 flute corner radius,with long shank length









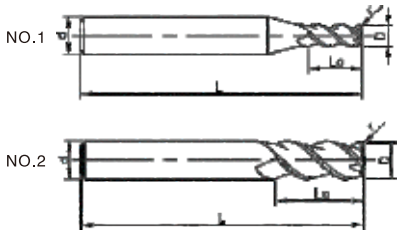
Ordering Code	Stock	D	Lc	r	L	d	Figure No.
N25UF-RH2-06005	○	6	15	0.5	75	6	2
N25UF-RH2-06010	○			1			
N25UF-RH2-06015	○			1.5			
N25UF-RH2-06020	○			2			
N25UF-RH2-08005	○	8	20	0.5	100	8	
N25UF-RH2-08010	○			1			
N25UF-RH2-08015	○			1.5			
N25UF-RH2-08020	○			2			
N25UF-RH2-10005	○	10	25	0.5		10	
N25UF-RH2-10010	○			1			
N25UF-RH2-10015	○			1.5			
N25UF-RH2-10020	○			2			
N25UF-RH2-10025	○			2.5			
N25UF-RH2-12005	○	12	30	0.5		12	
N25UF-RH2-12010	○			1			
N25UF-RH2-12015	○			1.5			
N25UF-RH2-12020	○			2			
N25UF-RH2-12025	○			2.5			
N25UF-RH2-16005	○	16	36	0.5	150	16	
N25UF-RH2-16010	○			1			
N25UF-RH2-16015	○			1.5			
N25UF-RH2-16020	○			2			
N25UF-RH2-16025	○			2.5			
N25UF-RH2-20005	○	20	45	0.5		20	
N25UF-RH2-20010	○			1			
N25UF-RH2-20015	○			1.5			
N25UF-RH2-20020	○			2			
N25UF-RH2-20030	○			3			

●Stock ○Availabie upon Order

N25UF 3 flute,corner radius







Ordering Code	Stock	D	Lc	r	L	d	Figure No.
N25UF-R3-01001	●	1	3	0.1	50	4	1
N25UF-R3-02002	●	2	6	0.2			
N25UF-R3-03002	●	3	9				
N25UF-R3-03003	●			0.3			
N25UF-R3-03005	●			0.5			
N25UF-R3-04002	●	4	11	0.2			2
N25UF-R3-04003	●			0.3			
N25UF-R3-04005	●			0.5			
N25UF-R3-04010	●			1			
N25UF-R3-05002	●	5	13	0.2		6	1
N25UF-R3-05003	●			0.3			
N25UF-R3-05005	●			0.5			
N25UF-R3-05010	●			1			
N25UF-R3-05015	●			1.5			
N25UF-R3-06005	●	6	16	0.5			2
N25UF-R3-06010	●			1			
N25UF-R3-06015	●			1.5			
N25UF-R3-06020	●			2			
N25UF-R3-08005	●	8	20	0.5	60	8	
N25UF-R3-08010	●			1			
N25UF-R3-08015	●			1.5			
N25UF-R3-08020	●			2			
N25UF-R3-10005	●	10	25	0.5	75	10	
N25UF-R3-10010	●			1			
N25UF-R3-10015	●			1.5			
N25UF-R3-10020	●			2			
N25UF-R3-10025	●			2.5			
N25UF-R3-12005	●	12	30	0.5		12	
N25UF-R3-12010	●			1			
N25UF-R3-12015	●			1.5			
N25UF-R3-12020	●			2			
N25UF-R3-12025	●			2.5			
N25UF-R3-16005	●	16	36	0.5	100	16	
N25UF-R3-16010	●			1			
N25UF-R3-16015	●			1.5			
N25UF-R3-16020	●			2			
N25UF-R3-16025	●			2.5			
N25UF-R3-20005	●	20	45	0.5		20	
N25UF-R3-20010	●			1			
N25UF-R3-20015	●			1.5			
N25UF-R3-20020	●			2			
N25UF-R3-20030	●			3			

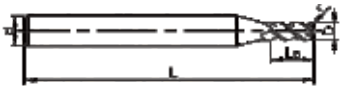
●Stock ○Availabie upon Order

N25UF 3 flute corner radius,with long shank length





NO.1



NO.2



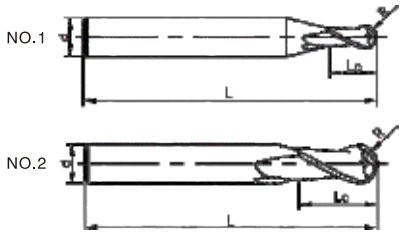
Ordering Code	Stock	D	Lc	r	L	d	Figure No.
N25UF-RH3-06005	●	6	15	0.5	75	6	2
N25UF-RH3-06010	●			1			
N25UF-RH3-06015	●			1.5			
N25UF-RH3-06020	●			2			
N25UF-RH3-08005	●	8	20	0.5	100	8	
N25UF-RH3-08010	●			1			
N25UF-RH3-08015	●			1.5			
N25UF-RH3-08020	●			2			
N25UF-RH3-10005	●	10	25	0.5		10	
N25UF-RH3-10010	●			1			
N25UF-RH3-10015	●			1.5			
N25UF-RH3-10020	●			2			
N25UF-RH3-10025	●			2.5			
N25UF-RH3-12005	●	12	30	0.5		12	
N25UF-RH3-12010	●			1			
N25UF-RH3-12015	●			1.5			
N25UF-RH3-12020	●			2			
N25UF-RH3-12025	●			2.5			
N25UF-RH3-16005	●	16	36	0.5	150	16	
N25UF-RH3-16010	●			1			
N25UF-RH3-16015	●			1.5			
N25UF-RH3-16020	●			2			
N25UF-RH3-16025	●			2.5			
N25UF-RH3-20005	●	20	45	0.5		20	
N25UF-RH3-20010	●			1			
N25UF-RH3-20015	●			1.5			
N25UF-RH3-20020	●			2			
N25UF-RH3-20030	●			3			

●Stock ○Availabie upon Order

N25UF 2 flute,ballnose







Ordering Code	Stock	D	R	Lc	L	d	Figure No.
N25UF-B2-01002	●	1	0.5	2	50	4	1
N25UF-B2-02004	●	2	1	4			
N25UF-B2-03006	●	3	1.5	6			
N25UF-B2-63006	●					6	
N25UF-B2-04008	●	4	2	8		4	2
N25UF-B2-64008	●					8	1
N25UF-B2-05010	●	5	2.5	10			
N25UF-B2-06012	●	6	3	12			2
N25UF-B2-07014	●	7	3.5	14	60	10	1
N25UF-B2-08014	●	8	4				2
N25UF-B2-09016	●	9	4.5	16	75	12	2
N25UF-B2-10018	●	10	5	18			
N25UF-B2-12022	●	12	6	22		16	
N25UF-B2-16026	●	16	8	26	100		

●Stock ○Availabie upon Order

P20F recommended cutting parameters

For Steels,Cast Iron—Side Miling

Workpicec Material				Cutting Speed(m/min)			Tool Diameter(mm)								
		a_p	a_e	Min	Optimum	Max	mm	3	4	6	8	10	12	16	20
P	P1	1.5×D	0.15×D	150	180	210	Fz	0.028	0.036	0.048	0.065	0.08	0.09	0.12	0.15
	P2	1.5×D	0.15×D	150	180	210	Fz	0.028	0.036	0.048	0.065	0.08	0.09	0.12	0.15
	P3	1.5×D	0.15×D	130	150	170	Fz	0.025	0.032	0.042	0.063	0.073	0.084	0.095	0.12
	P4	1×D	0.15×D	130	150	170	Fz	0.025	0.032	0.042	0.063	0.073	0.084	0.095	0.12
M	M1	1.5×D	0.15×D	120	150	180	Fz	0.028	0.036	0.048	0.066	0.085	0.09	0.12	0.13
	M2	1.5×D	0.15×D	110	130	160	Fz	0.025	0.032	0.043	0.063	0.074	0.085	0.095	0.11
	M3	1×D	0.12×D	100	120	140	Fz	0.021	0.027	0.038	0.054	0.06	0.065	0.07	0.08
K	K1	1.5×D	0.15×D	150	180	210	Fz	0.03	0.037	0.053	0.064	0.075	0.085	0.1	0.12
	K2	1.5×D	0.15×D	130	160	190	Fz	0.025	0.032	0.048	0.059	0.069	0.08	0.095	0.11

For Steels,Cast Iron—Slotting

Workpicec Material			Cutting Speed(m/min)			Tool Diameter(mm)								
		a_p	Min	Optimum	Max	mm	3	4	6	8	10	12	16	20
P	P1	0.8×D	60	80	95	Fz	0.025	0.042	0.052	0.062	0.072	0.082	0.125	0.16
	P2	0.8×D	60	80	95	Fz	0.025	0.042	0.052	0.062	0.072	0.082	0.125	0.16
	P3	0.5×D	55	75	90	Fz	0.022	0.037	0.047	0.052	0.062	0.072	0.105	0.13
	P4	0.5×D	55	70	85	Fz	0.022	0.037	0.047	0.052	0.062	0.072	0.105	0.13
M	M1	0.3×D	40	55	65	Fz	0.015	0.022	0.038	0.049	0.06	0.07	0.083	0.095
	M2	0.3×D	40	55	65	Fz	0.012	0.018	0.035	0.046	0.056	0.066	0.078	0.09
	M3	0.3×D	35	50	60	Fz	0.01	0.017	0.032	0.042	0.053	0.064	0.075	0.085
K	K1	0.5×D	50	60	70	Fz	0.022	0.037	0.047	0.052	0.063	0.074	0.105	0.13
	K2	0.5×D	45	55	65	Fz	0.018	0.028	0.043	0.05	0.06	0.07	0.085	0.096

For Steels,Cast Iron—Profiling

Workpicec Material				Cutting Speed(m/min)			Tool Diameter(mm)									
		a_p	a_e	Min	Optimum	Max	mm	4	5	6	7	8	9	10	11	12
P	P1	0.2×D	0.3×D	120	160	200	Fz	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12
	P2	0.2×D	0.3×D	120	160	200	Fz	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12
	P3	0.2×D	0.3×D	110	140	170	Fz	0.035	0.045	0.055	0.063	0.072	0.08	0.09	0.1	0.11
	P4	0.2×D	0.3×D	110	140	170	Fz	0.035	0.045	0.055	0.063	0.072	0.08	0.09	0.1	0.11
M	M1	0.2×D	0.2×D	80	110	130	Fz	0.035	0.045	0.055	0.063	0.072	0.08	0.09	0.1	0.11
	M2	0.2×D	0.2×D	80	110	130	Fz	0.035	0.045	0.055	0.063	0.072	0.08	0.09	0.1	0.11
	M3	0.1×D	0.1×D	70	85	100	Fz	0.032	0.042	0.052	0.058	0.065	0.072	0.08	0.087	0.095
K	K1	0.2×D	0.2×D	110	140	170	Fz	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12
	K2	0.2×D	0.2×D	110	140	170	Fz	0.035	0.045	0.055	0.063	0.072	0.08	0.09	0.1	0.11

This serie tools are most suitable for steels and cast iron,and also versatile for other materials listed above.

M20F recommended cutting parameters

Stainless Steels—Side Milling

Workpicec Material				Cutting Speed(m/min)			Tool Diameter(mm)									
		a_p	a_e	Min	Optimum	Max	mm	1	2	4	6	8	10	12	16	20
M	M1	1 × D	0.1 × D	100	120	150	Fz	0.011	0.018	0.03	0.042	0.059	0.071	0.08	0.105	0.113
	M2	1 × D	0.1 × D	90	110	130	Fz	0.008	0.013	0.028	0.038	0.057	0.066	0.076	0.085	0.095
	M3	1 × D	0.1 × D	80	100	110	Fz	0.006	0.01	0.022	0.032	0.046	0.052	0.057	0.062	0.072
S	S1	1 × D	0.05 × D	25	35	45	Fz	0.007	0.01	0.015	0.022	0.03	0.034	0.04	0.05	0.06
	S2	1 × D	0.05 × D	25	35	45	Fz	0.007	0.01	0.015	0.022	0.03	0.034	0.04	0.05	0.06
	S3	1 × D	0.05 × D	25	35	45	Fz	0.007	0.01	0.015	0.022	0.03	0.034	0.04	0.05	0.06
	S4	1 × D	0.08 × D	50	60	80	Fz	0.01	0.015	0.023	0.032	0.045	0.052	0.058	0.07	0.08

Stainless Steels—Side Slotting

Workpicec Material			Cutting Speed(m/min)			Tool Diameter(mm)									
		a_p	Min	Optimum	Max	mm	1	2	4	6	8	10	12	16	20
M	M1	0.3 × D	40	50	60	Fz	0.009	0.012	0.02	0.036	0.047	0.058	0.068	0.08	0.09
	M2	0.3 × D	40	50	60	Fz	0.007	0.01	0.017	0.033	0.044	0.054	0.064	0.075	0.085
	M3	0.3 × D	35	45	55	Fz	0.006	0.009	0.015	0.03	0.04	0.05	0.06	0.07	0.08
S	S1	0.25 × D	20	30	40	Fz	0.005	0.01	0.015	0.022	0.025	0.03	0.035	0.045	0.055
	S2	0.25 × D	20	30	40	Fz	0.005	0.01	0.015	0.022	0.025	0.03	0.035	0.045	0.055
	S3	0.25 × D	20	30	40	Fz	0.005	0.01	0.015	0.022	0.025	0.03	0.035	0.045	0.055
	S4	0.3 × D	30	50	70	Fz	0.008	0.013	0.018	0.025	0.03	0.035	0.04	0.05	0.06

Stainless Steels—Side Profiling

Workpicec Material				Cutting Speed(m/min)			Tool Diameter(mm)									
		a_p	a_e	Min	Optimum	Max	mm	1	2	4	6	8	10	12	16	20
M	M1	0.2 × D	0.2 × D	80	110	130	Fz	0.007	0.015	0.032	0.052	0.07	0.085	0.105	0.13	0.16
	M2	0.2 × D	0.2 × D	80	110	130	Fz	0.007	0.015	0.032	0.052	0.07	0.085	0.105	0.13	0.16
	M3	0.1 × D	0.1 × D	70	85	100	Fz	0.006	0.013	0.03	0.05	0.06	0.076	0.09	0.12	0.15
S	S1	0.15 × D	0.15 × D	30	40	50	Fz	0.006	0.013	0.03	0.05	0.068	0.082	0.1	0.12	0.15
	S2	0.15 × D	0.15 × D	30	40	50	Fz	0.006	0.013	0.03	0.05	0.068	0.082	0.1	0.12	0.15
	S3	0.15 × D	0.15 × D	30	40	50	Fz	0.006	0.013	0.03	0.05	0.068	0.082	0.1	0.12	0.15
	S4	0.3 × D	0.2 × D	60	70	80	Fz	0.01	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2

This serie tools are most suitable for stainless steels,and also versatile for other materials listed above.

H25UF recommended cutting parameters

Hardened Steels(Miniature,deep grooving)—Side Miling

Workpicec Material				Cutting Speed(m/min)	Tool Diameter(mm)						
		a_p	a_e		mm	0.4	0.6	0.8	1	1.5	2
P M K H	H1	1 × D	0.1 × D	Max.Speed Of Machine	Fz	0.009	0.012	0.015	0.021	0.023	0.028
	H2	0.7 × D	0.08 × D	Max.Speed Of Machine	Fz	0.011	0.014	0.017	0.023	0.028	0.033
	H3	0.5 × D	0.05 × D	Max.Speed Of Machine	Fz	0.012	0.015	0.019	0.025	0.03	0.035

Hardened Steels(Miniature,deep grooving)—Slotting

Workpicec Material			Cutting Speed(m/min)	Tool Diameter(mm)						
		a_p		mm	0.4	0.6	0.8	1	1.5	2
P M K H	H1	0.2 × D	Max.Speed Of Machine	Fz	0.006	0.009	0.012	0.018	0.02	0.025
	H2	0.1 × D	Max.Speed Of Machine	Fz	0.008	0.011	0.014	0.02	0.025	0.03
	H3	0.05 × D	Max.Speed Of Machine	Fz	0.009	0.012	0.016	0.022	0.027	0.032

Hardened Steels(Miniature,deep grooving)—Profiling

Workpicec Material				Cutting Speed(m/min)	Tool Diameter(mm)							
		a_p	a_e		mm	0.4	0.6	0.8	1	1.2	1.5	2
P M K H	H1	0.04 × D	0.03 × D	Max.Speed Of Machine	Fz	0.015	0.018	0.022	0.024	0.026	0.03	0.04
	H2	0.03 × D	0.03 × D	Max.Speed Of Machine	Fz	0.018	0.021	0.024	0.026	0.03	0.035	0.045
	H3	0.02 × D	0.02 × D	Max.Speed Of Machine	Fz	0.021	0.024	0.026	0.028	0.034	0.04	0.05

This serie tools are most suitable for steels and cast iron,and also versatile for other materials listed above.

1、Maximum T.I.R.in when tool is chucked is 0.01mm(0.01mm maximum recommended).
2、Make sure work piece and machine are stable and use a precision holder.
3、Please adjust the speed,feed and cutting depth according to actual cutting conditons.
4、The milling conditions are for an Endmills where the tool overhang length is less than 4*D(mill dia).
When the tool overhang length is longer,please adjust the speed,feed and cutting depth.

N25UF/NGK recommended cutting parameters

Aluminium Alloy–Side Milling

Workpicec Material				Cutting Speed(m/min)			Tool Diameter(mm)									
		a_p	a_e	Min	Optimum	Max	mm	1	2	4	6	8	10	12	16	20
N	N1	1.5×D	0.2×D	300	500	700	Fz	0.02	0.03	0.055	0.065	0.075	0.1	0.14	0.2	0.25
	N2	1.5×D	0.2×D	300	500	700	Fz	0.02	0.03	0.055	0.065	0.075	0.1	0.14	0.2	0.25
	N3	1.5×D	0.15×D	200	350	550	Fz	0.015	0.025	0.045	0.055	0.065	0.08	0.12	0.16	0.2
	N4	1.5×D	0.2×D	280	450	650	Fz	0.018	0.028	0.05	0.06	0.07	0.09	0.13	0.18	0.22
		a_p	a_e	Min	Optimum	Max	mm	1	2	4	6	8	10	12		
Graphite	N3	1×D	0.15×D	150	200	300	Fz	0.02	0.03	0.05	0.06	0.07	0.085	0.13		
	N5	1.5×D	0.5×D	150	250	400	Fz	0.03	0.05	0.07	0.09	0.11	0.15	0.18		

Aluminium Alloy—Slotting

Workpicec Material			Cutting Speed(m/min)			Tool Diameter(mm)									
		a_p	Min	Optimum	Max	mm	1	2	4	6	8	10	12	16	20
N	N1	0.8×D	180	250	300	Fz	0.015	0.025	0.045	0.058	0.07	0.08	0.095	0.16	0.19
	N2	0.8×D	180	250	300	Fz	0.015	0.025	0.045	0.058	0.07	0.08	0.095	0.16	0.19
	N3	0.5×D	150	200	250	Fz	0.01	0.018	0.035	0.045	0.055	0.065	0.078	0.13	0.16
	N4	0.8×D	160	220	280	Fz	0.012	0.02	0.04	0.05	0.06	0.07	0.084	0.14	0.17
		a_p	Min	Optimum	Max	mm	1	2	4	6	8	10	12		
Graphite	N3	0.5×D	120	180	250	Fz	0.012	0.02	0.04	0.05	0.06	0.07	0.09		
	N5	0.5×D	120	200	300	Fz	0.018	0.03	0.045	0.065	0.085	0.11	0.15		

Aluminium Alloy–Profiling

Workpicec Material				Cutting Speed(m/min)			Tool Diameter(mm)								
		a_p	a_e	Min	Optimum	Max	mm	1	2	4	6	8	10	12	16
N	N1	0.3×D	0.3×D	320	450	600	Fz	0.025	0.05	0.08	0.12	0.16	0.2	0.24	0.32
	N2	0.3×D	0.3×D	320	450	600	Fz	0.025	0.05	0.08	0.12	0.16	0.2	0.24	0.32
	N3	0.3×D	0.3×D	250	320	400	Fz	0.02	0.04	0.06	0.1	0.14	0.18	0.22	0.25
	N4	0.3×D	0.3×D	300	400	500	Fz	0.022	0.045	0.07	0.11	0.15	0.19	0.23	0.28
		a_p	a_e	Min	Optimum	Max	mm	0.5	1	2	4	6	8	10	12
Graphite	N3	0.3×D	0.3×D	150	200	300	Fz	0.008	0.018	0.032	0.045	0.06	0.08	0.11	0.13
	N5	0.4×D	0.5×D	150	250	400	Fz	0.01	0.02	0.035	0.05	0.07	0.09	0.12	0.15

This serie tools are most suitable for stainless steels,and also versatile for other materials listed above.