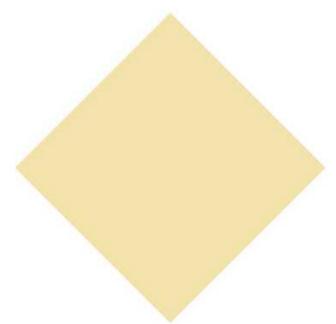


For Tough Steel, Cast Iron, Stainless Steel

And Exotic Materials:

**NOTHING CUTS  
IT BETTER!**



**M<sub>9</sub> Pro**

- ▶ 4 Flute & 6 Flute
- ▶ Square, Chamfer, Radius, Ball Nose
- ▶ Standard & Extended Length
- ▶ Plain & Weldon Flat Shanks
- ▶ Inch Sizes

# M9 Pro

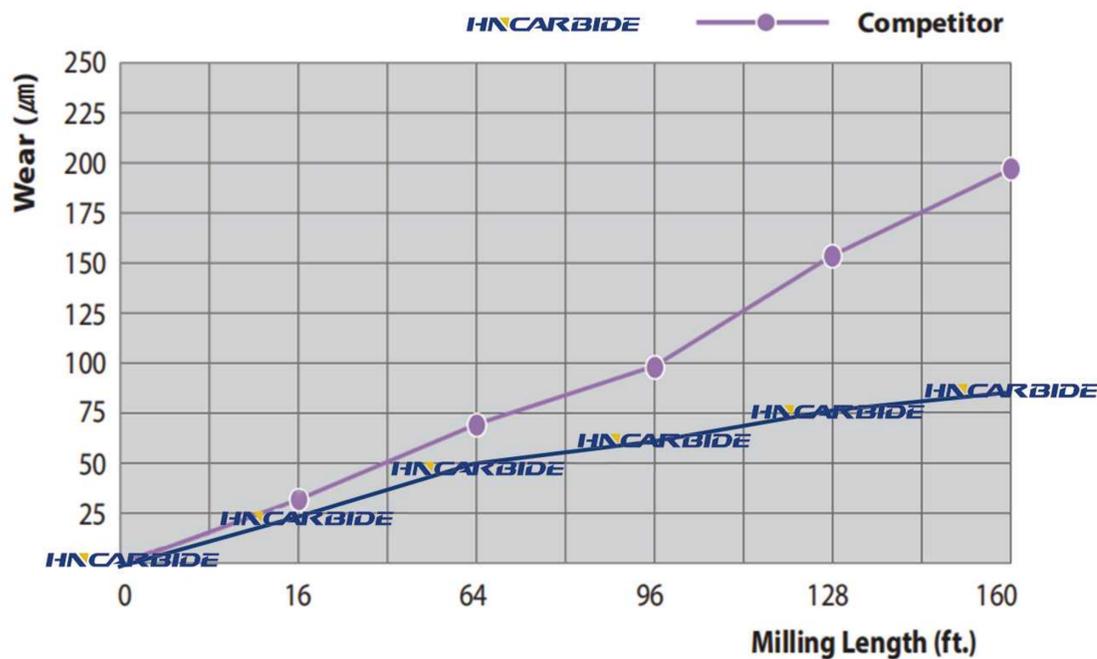
Innovative cutting  
Corner Radius  
performance that's not just  
a chip off the old block.

## 4 FLUTE

### HIGH-PERFORMANCE SOLID CARBIDE 4 FLUTE END MILLS

### CASE STUDY

#### 4 Flute vs Competitor



	M9 Pro	Competitor
Wear (µm)	83.518	203.381
Milling Length (ft.)	160	160
Size (mm)	1/2x1/2x5/8x2 1/2	
Work Material	- JIS : S45C(HRc30) - WR : 1.0503	- DIN : C45 - AISI: 1405
Cutting Speed	755 ft/min.	
RPM	7,324 rev./min.	
Feed	57.64 inch/min.	
Feed per tooth	.002 inch/tooth	
Milling Method	Down & Side Cutting	
Milling Depth	Axial : .394 inch, Radial : .118 inch	
Coolant	Wet Cut	
Overhang	1.339 inch	
Machine	Machining Center	

AICRN-Coated SOLID CARBIDE END MILLS  
4 FLUTE STANDARD LENGTH (PLAIN SHANK)

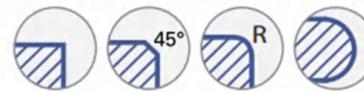
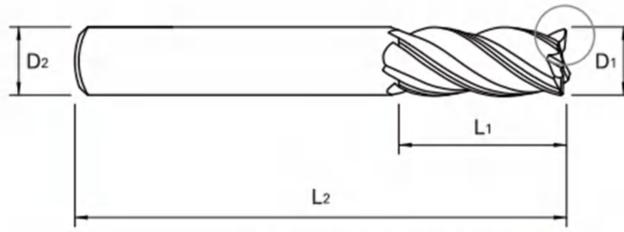
Square UPM68001

Chamfer UPM70001

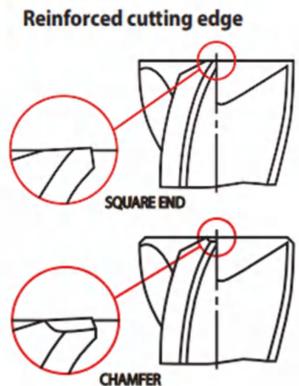
Corner Radius UPM72001

Ball Nose UPM76001

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
- Advanced coating for superior performance and tool life



SEE CHAMFER AND BALL KEYS ON PAGE 11



Unit : INCH

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End EDP No.	Chamfer EDP No.	Corner Radius								Ball Nose EDP No.
						.010	.015	.030	.060	.090	.125	.190	.250	
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	
1/8	1/8	1/8	1 1/2	UPM68001		UPM72001		UPM72057						UPM76001
		3/8	1 1/2	UPM68002		UPM72002		UPM72058						UPM76002
		1/2	2 1/2	UPM68003		UPM72003		UPM72059						UPM76003
5/32	3/16	3/16	2	UPM68004		UPM72004								UPM76004
		7/16	2	UPM68005		UPM72005								UPM76005
3/16	3/16	3/16	2	UPM68006		UPM72006								UPM76006
		5/16	2	UPM68007		UPM72007		UPM72060						UPM76007
		7/16	2	UPM68008		UPM72008		UPM72061						UPM76008
		5/8	2 1/2	UPM68009		UPM72009		UPM72062						UPM76009
7/32	1/4	1/4	2	UPM68010		UPM72010								UPM76010
		7/16	2 1/2	UPM68011		UPM72011								UPM76011
1/4	1/4	3/8	2	UPM68012	UPM70001	UPM72012		UPM72063	UPM72109					UPM76012
		1/2	2 1/2	UPM68013			UPM72026	UPM72064	UPM72110					UPM76013
		3/4	2 1/2	UPM68014	UPM70002	UPM72013	UPM72027	UPM72065	UPM72111					UPM76014
		1	3	UPM68015			UPM72028	UPM72066	UPM72112					UPM76015
9/32	5/16	5/8	2 1/2	UPM68016			UPM72029	UPM72067	UPM72113					UPM76016
		1	3	UPM68017			UPM72030	UPM72068						UPM76017
5/16	5/16	7/16	2	UPM68018				UPM72069						UPM76018
		13/16	2 1/2	UPM68019	UPM70003	UPM72014		UPM72070	UPM72114					UPM76019
		1 1/4	3	UPM68020			UPM72031	UPM72071	UPM72115					UPM76020
11/32	3/8	1/2	2 1/2	UPM68021				UPM72072						UPM76021
		13/16	2 1/2	UPM68022				UPM72073						UPM76022

► Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

NEXT PAGE ►

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

◎ : Excellent ○ : Good

ISO	P										M				K				S									
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel				Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37	
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

**NEW SIZES**

**AICRN-Coated SOLID CARBIDE END MILLS**  
**4 FLUTE STANDARD LENGTH (PLAIN SHANK)**

SERIES

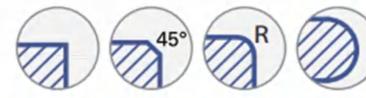
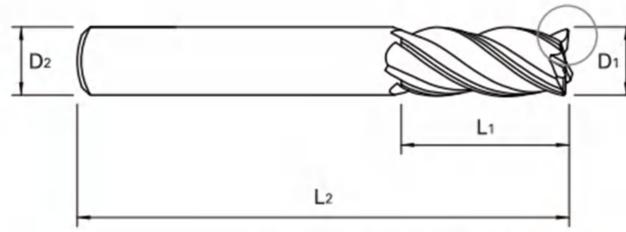
Square **UPM68023**

Chamfer **UPM70004**

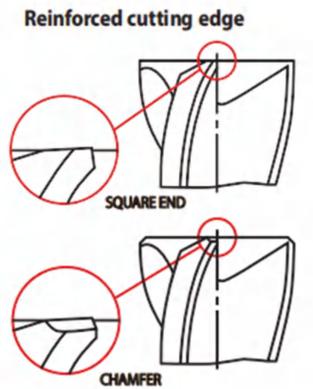
Corner Radius **UPM72015**

Ball Nose **UPM76023**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life



SEE CHAMFER AND BALL KEYS ON PAGE 11



Unit : INCH

\* NEW SIZES

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End EDP No.	Chamfer EDP No.	Corner Radius								Ball Nose EDP No.
						.010 EDP No.	.015 EDP No.	.030 EDP No.	.060 EDP No.	.090 EDP No.	.125 EDP No.	.190 EDP No.	.250 EDP No.	
						3/8	3/8	1/2	2 1/2	UPM68023	UPM70004	UPM72015		
		7/8	2 1/2	UPM68024	UPM70005	UPM72016		UPM72075	UPM72117	UPM72147				UPM76024
		1	3	UPM68025		UPM72017		UPM72076	UPM72118	UPM72148				UPM76025
		1 1/4	3	UPM68026		UPM72018		UPM72077	UPM72119	UPM72149				UPM76026
13/32	7/16	1/2	2 3/4	UPM68027				UPM72078						UPM76027
		15/16	2 3/4	UPM68028				UPM72079						UPM76028
7/16	7/16	5/8	2 1/2	UPM68029			UPM72032	UPM72080	UPM72120	UPM72150				UPM76029
		7/8	2 3/4	UPM68030	UPM70006		UPM72033	UPM72081	UPM72121	UPM72151				UPM76030
		1	2 3/4	UPM68031		UPM72019		UPM72082	UPM72122					UPM76031
15/32	1/2	5/8	2 1/2	UPM68032				UPM72083						UPM76032
		1	3	UPM68033				UPM72084						UPM76033
		1 1/4	3 1/2	UPM68034				UPM72085						UPM76034
1/2	1/2	5/8	2 1/2	UPM68035	UPM70007	UPM72020	UPM72034	UPM72086	UPM72123	UPM72152	UPM72175			UPM76035
		1	3	UPM68036	UPM70008	UPM72021	UPM72035	UPM72087	UPM72124	UPM72153	UPM72176			UPM76036
		1 1/4	3	UPM68037	UPM70009	UPM72022	UPM72036	UPM72088	UPM72125	UPM72154	UPM72177			UPM76037
		1 1/4	3 1/2	UPM68038	UPM70010	UPM72023	UPM72037	UPM72089	UPM72126	UPM72155	UPM72178			UPM76038
		1 5/8	4	UPM68039	UPM70011			UPM72090	UPM72127	UPM72156	UPM72179			UPM76039
		2	4	UPM68040				UPM72091	UPM72128	UPM72157	UPM72180			UPM76040
		2 1/2	4 1/2	UPM68041	UPM70012			UPM72092	UPM72129	UPM72158	UPM72181			UPM76041

▶ Length of cut in excess of 3 x D on 37° single-helix requires feed reduction of approximately 50%

NEXT PAGE ▶

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

◎ : Excellent ○ : Good

ISO	P											M			K				S									
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

AICRN-Coated SOLID CARBIDE END MILLS  
4 FLUTE STANDARD LENGTH (PLAIN SHANK)

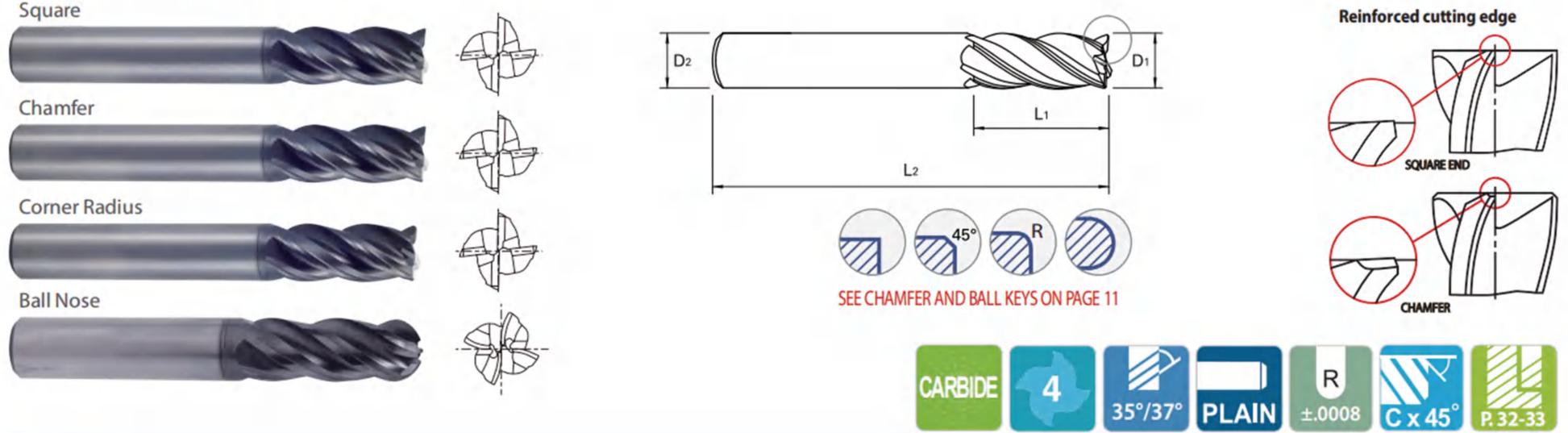
Square UPM68042

Chamfer UPM70013

Corner Radius UPM72024

Ball Nose UPM76042

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- Advanced coating for superior performance and tool life



Unit : INCH

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End	Chamfer	Corner Radius								Ball Nose
						.010	.015	.030	.060	.090	.125	.190	.250	
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	
5/8	5/8	3/4	3	UPM68042		UPM72024	UPM72041	UPM72093	UPM72130	UPM72159	UPM72182			UPM76042
		1 1/4	3 1/2	UPM68043	UPM70013	UPM72025	UPM72042	UPM72094	UPM72131	UPM72160	UPM72183			UPM76043
		1 5/8	4	UPM68044	UPM70014		UPM72043	UPM72095	UPM72132	UPM72161	UPM72184			UPM76044
		2	4	UPM68045			UPM72044	UPM72096	UPM72133	UPM72162	UPM72185			UPM76045
		3 1/4	6	UPM68046			UPM72045	UPM72097	UPM72134	UPM72163	UPM72186			UPM76046
3/4	3/4	3/4	3	UPM68047	UPM70015		UPM72046	UPM72098	UPM72135	UPM72164	UPM72187	UPM72198	UPM72209	UPM76047
		1 1/2	4	UPM68048	UPM70016		UPM72047	UPM72099	UPM72136	UPM72165	UPM72188	UPM72199	UPM72210	UPM76048
		1 7/8	4	UPM68049			UPM72048	UPM72100	UPM72137	UPM72166	UPM72189	UPM72200	UPM72211	UPM76049
		2 1/4	5	UPM68050	UPM70017		UPM72049	UPM72101	UPM72138	UPM72167	UPM72190	UPM72201	UPM72212	UPM76050
		3 1/4	6	UPM68051			UPM72050	UPM72102	UPM72139	UPM72168	UPM72191	UPM72202	UPM72213	UPM76051
1	1	1	4	UPM68052	UPM70018		UPM72051	UPM72103	UPM72140	UPM72169	UPM72192	UPM72203	UPM72214	UPM76052
		1 1/2	4	UPM68053	UPM70019		UPM72052	UPM72104	UPM72141	UPM72170	UPM72193	UPM72204	UPM72215	UPM76053
		2	5	UPM68054	UPM70020		UPM72053	UPM72105	UPM72142	UPM72171	UPM72194	UPM72205	UPM72216	UPM76054
		2 5/8	5	UPM68055	UPM70021		UPM72054	UPM72106	UPM72143	UPM72172	UPM72195	UPM72206	UPM72217	UPM76055
		3	6	UPM68056			UPM72055	UPM72107	UPM72144	UPM72173	UPM72196	UPM72207	UPM72218	UPM76056
		4 1/4	7	UPM68057			UPM72056	UPM72108	UPM72145	UPM72174	UPM72197	UPM72208	UPM72219	UPM76057

► Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

CHAMFER KEY		BALLNOSE KEY		BALLNOSE KEY	
Mill Diameter	Chamfer Size	Mill Diameter	Radius of Ball	Mill Diameter	Radius of Ball
1/4	.007	1/8	1/16	11/32	11/64
5/16	.007	5/32	5/64	3/8	3/16
3/8	.011	3/16	3/32	7/16	7/32
7/16	.013	7/32	7/64	1/2	1/4
1/2	.013	1/4	1/8	5/8	5/16
5/8	.015	9/32	9/64	3/4	3/8
1/4	.019	5/16	5/32	1	1/2
1	.019				

◎ : Excellent ○ : Good

ISO	P											M				K				S							
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel	Stainless steel				Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○



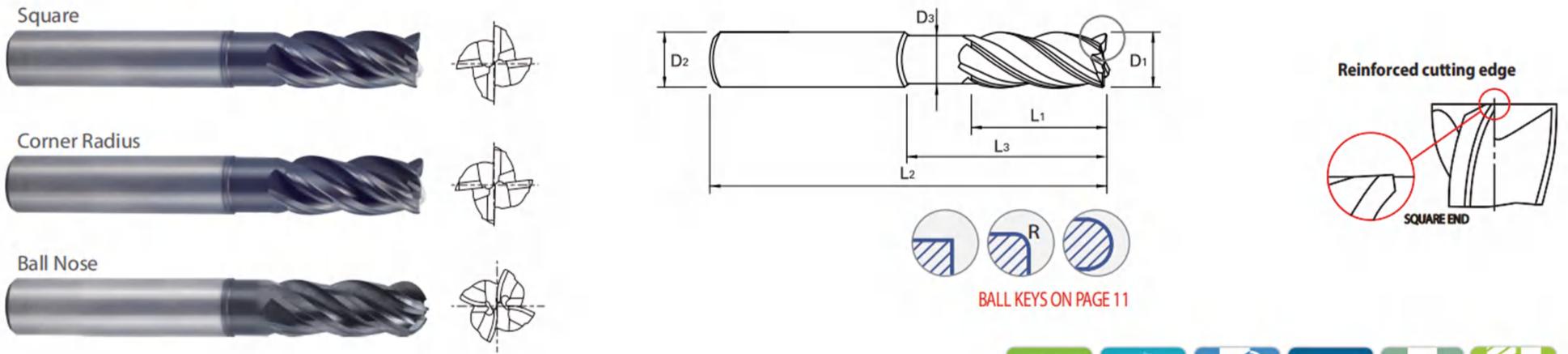
AICRN-Coated SOLID CARBIDE END MILLS  
4 FLUTE EXTENDED LENGTH (PLAIN SHANK)

Corner Radius **UPM80001**

Square **UPM78001**

Ball Nose **UPM82001**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life



CARBIDE 4 35°/37° PLAIN ±.0008 P.32-33

Unit : INCH

OD (D1)	SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Square End EDP No.	Corner Radius								Ball Nose EDPNo.		
							.010	.015	.030	.060	.090	.125	.190	.250			
							EDPNo.	EDP No.	EDP No.	EDP No.	EDPNo.	EDP No.	EDPNo.	EDP No.			
1/8	1/8	5/32	3/8	3	.113	UPM78001	UPM80001			UPM80020							UPM82001
		5/32	1/2	3	.113	UPM78002	UPM80002			UPM80021							UPM82002
		5/32	5/8	3	.113	UPM78003	UPM80003			UPM80022							UPM82003
3/16	3/16	7/32	1/2	3	.176	UPM78004	UPM80004			UPM80023							UPM82004
		7/32	3/4	3	.176	UPM78005	UPM80005			UPM80024							UPM82005
		7/32	1	3	.176	UPM78006	UPM80006			UPM80025							UPM82006
1/4	1/4	3/8	3/4	4	.230	UPM78007		UPM80007	UPM80026	UPM80056							UPM82007
		3/8	1 1/8	4	.230	UPM78008		UPM80008	UPM80027	UPM80057							UPM82008
		3/8	2 1/8	4	.230	UPM78009		UPM80009	UPM80028	UPM80058							UPM82009
3/8	3/8	1/2	1 1/8	4	.344	UPM78010		UPM80010	UPM80029	UPM80059	UPM80086						UPM82010
		1/2	2 1/8	4	.344	UPM78011		UPM80011	UPM80030	UPM80060	UPM80087						UPM82011
		1/2	3 1/8	5	.344	UPM78012		UPM80012	UPM80031	UPM80061	UPM80088						UPM82012
		1/2	3 1/8	6	.344	UPM78013		UPM80013	UPM80032	UPM80062	UPM80089						UPM82013
		1/2	4 1/8	6	.344	UPM78014		UPM80014	UPM80033	UPM80063	UPM80090						UPM82014
1/2	1/2	5/8	1 1/2	4	.461	UPM78015		UPM80015	UPM80034	UPM80064	UPM80091	UPM80113					UPM82015
		5/8	2 1/4	4	.461	UPM78016		UPM80016	UPM80035	UPM80065	UPM80092	UPM80114					UPM82016
		5/8	3 3/8	5	.461	UPM78017		UPM80017	UPM80036	UPM80066	UPM80093	UPM80115					UPM82017
		5/8	3 3/8	6	.461	UPM78018		UPM80018	UPM80037	UPM80067	UPM80094	UPM80116					UPM82018
		5/8	4 1/8	6	.461	UPM78019		UPM80019	UPM80038	UPM80068	UPM80095	UPM80117					UPM82019

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

NEXT PAGE ▶

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

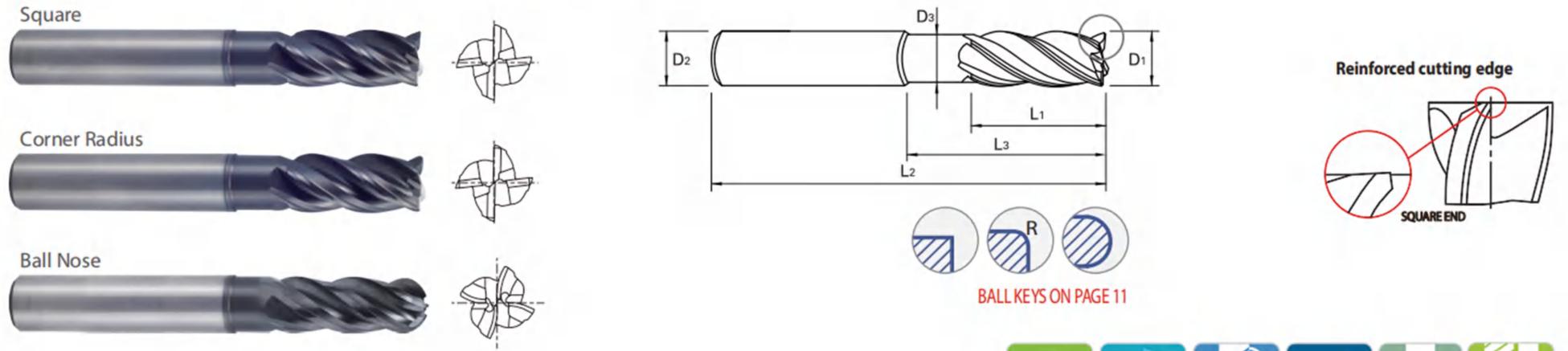
◎ : Excellent ○ : Good

ISO	P											M				K				S								
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel				Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

**AICRN-Coated SOLID CARBIDE END MILLS**  
**4 FLUTE EXTENDED LENGTH (PLAIN SHANK)**

Square	<b>UPM78020</b>
Corner Radius	<b>UPM80039</b>
Ball Nose	<b>UPM82020</b>

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
- ▶ Advanced coating for superior performance and tool life



CARBIDE 4 35°/37° PLAIN R ±.0008 P.32-33

Unit : INCH

OD (D1)	SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Square End EDP No.	Corner Radius								Ball Nose EDPNo.
							.010	.015	.030	.060	.090	.125	.190	.250	
							EDPNo.	EDP No.	EDP No.	EDP No.	EDPNo.	EDP No.	EDPNo.	EDP No.	
5/8	5/8	3/4	1 5/8	4	.586	UPM78020			UPM80039	UPM80069	UPM80096	UPM80118			UPM82020
		3/4	2 3/8	5	.586	UPM78021			UPM80040	UPM80070	UPM80097	UPM80119			UPM82021
		3/4	3 3/8	5	.586	UPM78022			UPM80041	UPM80071	UPM80098	UPM80120			UPM82022
		3/4	2 3/8	6	.586	UPM78023			UPM80042	UPM80072	UPM80099	UPM80121			UPM82023
		3/4	3 3/8	6	.586	UPM78024			UPM80043	UPM80073	UPM80100	UPM80122			UPM82024
		3/4	4 1/8	6	.586	UPM78025			UPM80044	UPM80074	UPM80101	UPM80123			UPM82025
3/4	3/4	1	2	4	.711	UPM78026			UPM80045	UPM80075	UPM80102	UPM80124	UPM80135	UPM80146	UPM82026
		1	3	5	.711	UPM78027			UPM80046	UPM80076	UPM80103	UPM80125	UPM80136	UPM80147	UPM82027
		1	2 1/2	6	.711	UPM78028			UPM80047	UPM80077	UPM80104	UPM80126	UPM80137	UPM80148	UPM82028
		1	3	6	.711	UPM78029			UPM80048	UPM80078	UPM80105	UPM80127	UPM80138	UPM80149	UPM82029
		1	4	6	.711	UPM78030			UPM80049	UPM80079	UPM80106	UPM80128	UPM80139	UPM80150	UPM82030
1	1	1 1/8	2	4	.961	UPM78031			UPM80050	UPM80080	UPM80107	UPM80129	UPM80140	UPM80151	UPM82031
		1 1/8	2 5/8	5	.961	UPM78032			UPM80051	UPM80081	UPM80108	UPM80130	UPM80141	UPM80152	UPM82032
		1 1/8	3	5	.961	UPM78033			UPM80052	UPM80082	UPM80109	UPM80131	UPM80142	UPM80153	UPM82033
		1 1/8	2 5/8	6	.961	UPM78034			UPM80053	UPM80083	UPM80110	UPM80132	UPM80143	UPM80154	UPM82034
		1 1/8	3	6	.961	UPM78035			UPM80054	UPM80084	UPM80111	UPM80133	UPM80144	UPM80155	UPM82035
		1 1/8	4	6	.961	UPM78036			UPM80055	UPM80085	UPM80112	UPM80134	UPM80145	UPM80156	UPM82036

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

◎ : Excellent ○ : Good

ISO	P											M			K				S									
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37	
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

AICRN-Coated SOLID CARBIDE END MILLS  
4 FLUTE EXTENDED LENGTH (FLAT SHANK)

Square

UPM78010W

Corner Radius

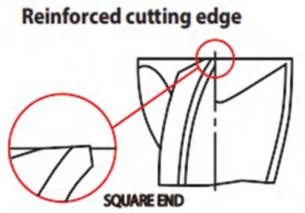
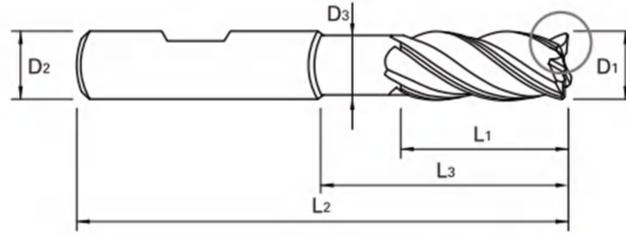
UPM80029W

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
- ▶ Advanced coating for superior performance and tool life

Square



Corner Radius



Unit : INCH

OD (D1)	SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Square End EDP No.	Corner Radius								Ball Nose EDPNo.												
							.010	.015	.030	.060	.090	.125	.190	.250													
							EDPNo.	EDP No.	EDP No.	EDP No.	EDPNo.	EDP No.	EDPNo.	EDP No.													
3/8	3/8	1/2	1 1/8	4	.344	UPM78010W			UPM80029W																		
		1/2	2 1/8	4	.344	UPM78011W			UPM80030W																		
		1/2	3 1/8	5	.344	UPM78012W			UPM80031W																		
		1/2	3 1/8	6	.344	UPM78013W			UPM80032W																		
		1/2	4 1/8	6	.344	UPM78014W			UPM80033W																		
1/2	1/2	5/8	1 1/2	4	.461	UPM78015W			UPM80034W																		
		5/8	2 1/4	4	.461	UPM78016W			UPM80035W																		
		5/8	3 3/8	5	.461	UPM78017W			UPM80036W																		
		5/8	3 3/8	6	.461	UPM78018W			UPM80037W																		
		5/8	4 1/8	6	.461	UPM78019W			UPM80038W																		
5/8	5/8	3/4	1 5/8	4	.586	UPM78020W			UPM80039W																		
		3/4	2 3/8	5	.586	UPM78021W			UPM80040W																		
		3/4	3 3/8	5	.586	UPM78022W			UPM80041W																		
		3/4	2 3/8	6	.586	UPM78023W			UPM80042W																		
		3/4	3 3/8	6	.586	UPM78024W			UPM80043W																		
		3/4	4 1/8	6	.586	UPM78025W			UPM80044W																		
3/4	3/4	1	2	4	.711	UPM78026W			UPM80045W																		
		1	3	5	.711	UPM78027W			UPM80046W																		
		1	3	6	.711	UPM78029W			UPM80048W																		
		1	4	6	.711	UPM78030W			UPM80049W																		
1	1	1 1/8	2	4	.961	UPM78031W			UPM80050W																		
		1 1/8	2 5/8	5	.961	UPM78032W			UPM80051W																		
		1 1/8	3	5	.961	UPM78033W			UPM80052W																		
		1 1/8	3	6	.961	UPM78035W			UPM80054W																		
		1 1/8	4	6	.961	UPM78036W			UPM80055W																		

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	h5 ( ≥ Ø1/2" : h6 )

◎ : Excellent ○ : Good

ISO	P											M				K				S							
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel				Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37
VDI 3323																											
Hrc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○

# M9 Pro

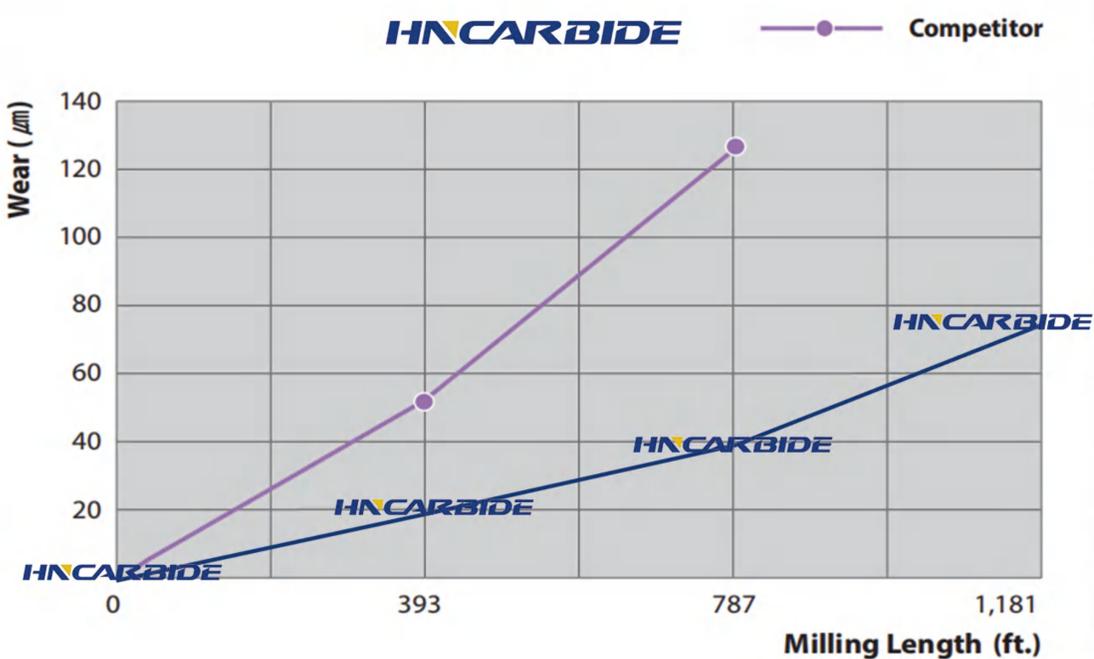
Say goodbye to milling tool fatigue and hello to the innovative M9Pro 6 Flute tool.

# 6 FLUTE

## HIGH-PERFORMANCE SOLID CARBIDE 6 FLUTE END MILLS

## CASE STUDY

### 6 Flute vs. Competitor



	V7 Plus A	Competitor
Wear(µm)	70.855	123.776
Milling Length (ft.)	1,181	787
Size (mm)	1/2x1/2x5/8x3	
Work Material	- JIS : S45C(HRc30) - DIN : C45	- WR : 1.0503 - AISI: 1405
Cutting Speed/RPM	914 ft./min. / 7,392 rev./min.	
Feed/Feed per tooth	295.08 in./min. / .007 in./tooth	
Milling Method	Trochoidal Cutting	
Milling Depth	Axial: .945 in., Radial: .024 in.	
Coolant	Wet Cut	
Overhang	1.417 in.	
Machine	Machining Center	

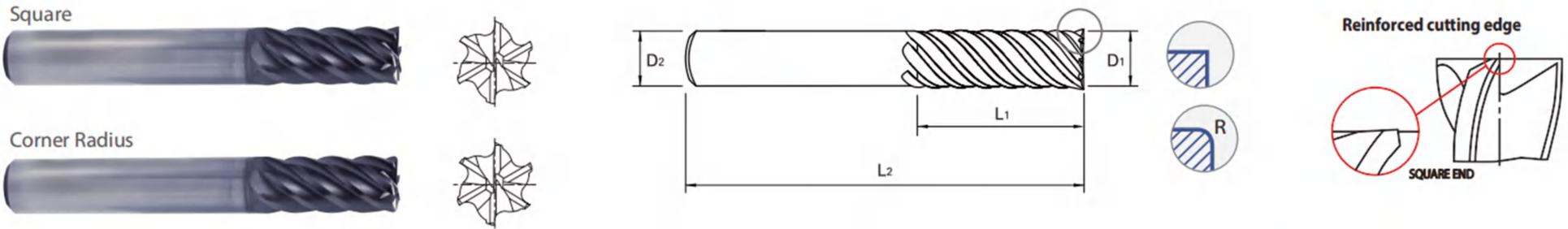
NEW SIZES

AICRN-Coated SOLID CARBIDE END MILLS  
6 FLUTE STANDARD LENGTH (PLAIN SHANK)

SERIES

Square UHM86001  
Corner Radius UHM88001

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : INCH

\* (NEW SIZES)

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End	Corner Radius									
					.015	.030	.060	.090	.120	.125	.190	.250		
					EDP No.	EDP No.	EDP No.	EDP No.	EDPNo.	EDPNo.	EDPNo.	EDPNo.		
1/4	1/4	1/2	2 1/2	UHM86001	UHM88001	UHM88037	UHM88072							
		3/4	2 1/2	UHM86002	UHM88002	UHM88038	UHM88073							
		1 1/8	3	UHM86003	UHM88003	UHM88039	UHM88074							
		1 1/2	4	UHM86004	UHM88004	UHM88040	UHM88075							
5/16	5/16	3/4	2 1/2	UHM86005	UHM88005									
		1 1/4	3	UHM86006	UHM88006	UHM88041								
		1 5/8	4	UHM86007	UHM88007	UHM88042								
3/8	3/8	5/8	2 1/2	UHM86008	UHM88008	UHM88043	UHM88076	UHM88105						
		1	3	UHM86009	UHM88009	UHM88044	UHM88077	UHM88106						
		1 1/2	4	UHM86010	UHM88010	UHM88045	UHM88078	UHM88107						
		2	4	UHM86011	UHM88011	UHM88046	UHM88079	UHM88108						
1/2	1/2	5/8	3	UHM86012	UHM88012	UHM88047	UHM88080	UHM88109		UHM88145				
		1	3	UHM86013	UHM88013	UHM88048	UHM88081	UHM88110		UHM88146				
		1	3 1/4	UHM86014										
		1 1/4	3	UHM86015	UHM88014	UHM88049	UHM88082	UHM88111	UHM88134	UHM88147				
		1 1/4	3 1/2	UHM86016	UHM88015	UHM88050	UHM88083	UHM88112	UHM88135	UHM88148				
		1 5/8	4	UHM86017	UHM88016	UHM88051	UHM88084	UHM88113		UHM88149				
		2	4	UHM86018	UHM88017	UHM88052	UHM88085	UHM88114	UHM88136	UHM88150				
		2 5/8	5	UHM86019	UHM88018	UHM88053	UHM88086	UHM88115		UHM88151				
3	5	UHM86020	UHM88019	UHM88054	UHM88087	UHM88116	UHM88137	UHM88152						

NEXT PAGE ►

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

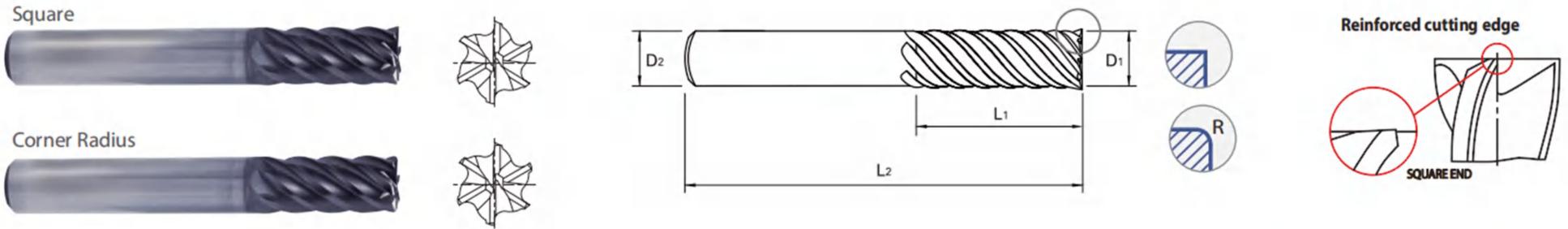
◎ : Excellent ○ : Good

ISO	P											M			K			S									
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys						
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○

**AICRN-Coated SOLID CARBIDE END MILLS**  
**6 FLUTE STANDARD LENGTH (PLAIN SHANK)**

Square **UHM86021**  
 Corner Radius **UHM88020**

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : INCH

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End	Corner Radius							
					.015	.030	.060	.090	.120	.125	.190	.250
					EDP No.	EDP No.	EDP No.	EDP No.	EDPNo.	EDPNo.	EDPNo.	EDPNo.
5/8	5/8	3/4	3	UHM86021	UHM88020	UHM88055	UHM88088	UHM88117		UHM88153		
		1 1/4	3 1/2	UHM86022	UHM88021	UHM88056	UHM88089	UHM88118	UHM88138	UHM88154		
		1 7/8	4	UHM86023	UHM88022	UHM88057	UHM88090	UHM88119		UHM88155		
		2	4	UHM86024	UHM88023	UHM88058	UHM88091	UHM88120	UHM88139	UHM88156		
		2 5/8	5	UHM86025	UHM88024	UHM88059	UHM88092	UHM88121		UHM88157		
		3	5	UHM86026	UHM88025	UHM88060	UHM88093	UHM88122	UHM88140	UHM88158		
3/4	3/4	1	3 1/2	UHM86027	UHM88026	UHM88061	UHM88094	UHM88123		UHM88159	UHM88170	UHM88181
		1 1/2	4	UHM86028	UHM88027	UHM88062	UHM88095	UHM88124	UHM88141	UHM88160	UHM88171	UHM88182
		1 7/8	5	UHM86029	UHM88028	UHM88063	UHM88096	UHM88125		UHM88161	UHM88172	UHM88183
		2 1/4	5	UHM86030	UHM88029	UHM88064	UHM88097	UHM88126		UHM88162	UHM88173	UHM88184
		2 3/4	5	UHM86031	UHM88030	UHM88065	UHM88098	UHM88127		UHM88163	UHM88174	UHM88185
		3	5 1/2	UHM86032	UHM88031	UHM88066	UHM88099	UHM88128	UHM88142	UHM88164	UHM88175	UHM88186
1	1	1 1/2	4	UHM86033	UHM88032	UHM88067	UHM88100	UHM88129	UHM88143	UHM88165	UHM88176	UHM88187
		2	5	UHM86034	UHM88033	UHM88068	UHM88101	UHM88130		UHM88166	UHM88177	UHM88188
		2 5/8	5	UHM86035	UHM88034	UHM88069	UHM88102	UHM88131		UHM88167	UHM88178	UHM88189
		3 1/4	6	UHM86036	UHM88035	UHM88070	UHM88103	UHM88132		UHM88168	UHM88179	UHM88190
		4	7	UHM86037	UHM88036	UHM88071	UHM88104	UHM88133	UHM88144	UHM88169	UHM88180	UHM88191

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M			K				S								
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys			Titanium Alloys					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○

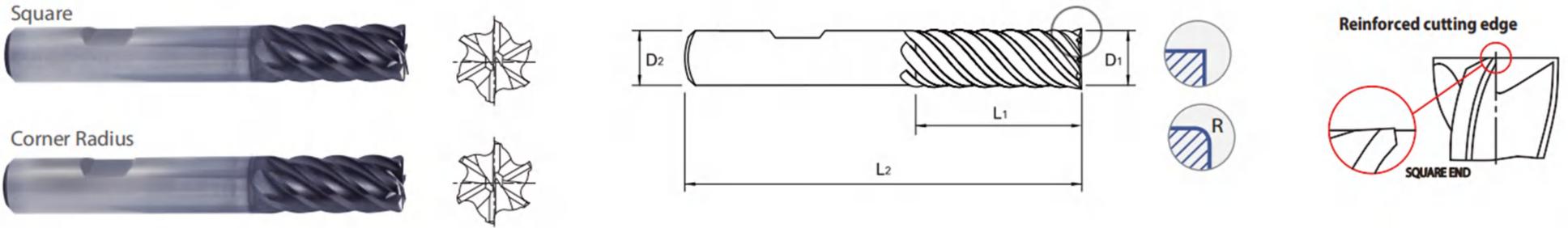
NEW SIZES

AICRN-Coated SOLID CARBIDE END MILLS  
6 FLUTE STANDARD LENGTH (FLAT SHANK)

SERIES

Square UHM86009W  
Corner Radius UHM88009W

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : INCH

\* NEW SIZES

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End EDP No.	Corner Radius				
					.015	.030	.060	.090	.120
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/8	3/8	1	3	UHM86009W	UHM88009W	UHM88044W	UHM88077W		
		1 1/2	4	UHM86010W	UHM88010W	UHM88045W	UHM88078W		
		2	4	UHM86011W	UHM88011W	UHM88046W	UHM88079W		
1/2	1/2	1	3	UHM86013W	UHM88013W	UHM88048W	UHM88081W		
		1	3 1/4	UHM86014W					
		1 1/4	3	UHM86015W	UHM88014W	UHM88049W	UHM88082W	UHM88111W	UHM88134W
		1 1/4	3 1/2	UHM86016W		UHM88050W	UHM88083W	UHM88112W	UHM88135W
		2	4	UHM86018W		UHM88052W	UHM88085W	UHM88114W	UHM88136W
		3	5	UHM86020W		UHM88054W	UHM88087W	UHM88116W	UHM88137W
5/8	5/8	1 1/4	3 1/2	UHM86022W		UHM88056W	UHM88089W	UHM88118W	UHM88138W
		2	4	UHM86024W		UHM88058W	UHM88091W	UHM88120W	UHM88139W
		3	5	UHM86026W		UHM88060W	UHM88093W	UHM88122W	UHM88140W
3/4	3/4	1 1/2	4	UHM86028W		UHM88062W	UHM88095W	UHM88124W	UHM88141W
		3	5 1/2	UHM86032W		UHM88066W	UHM88099W	UHM88128W	UHM88142W
1	1	1 1/2	4	UHM86033W		UHM88067W	UHM88100W	UHM88129W	UHM88143W
		4	7	UHM86037W		UHM88071W	UHM88104W	UHM88133W	UHM88144W

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	h5 (≥ Ø12 : h6)

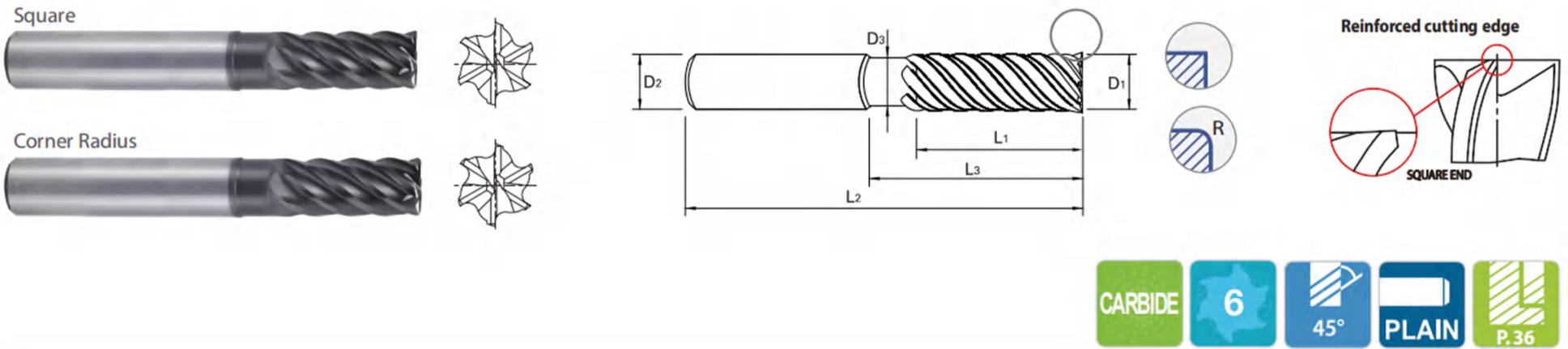
◎ : Excellent ○ : Good

ISO	P											M			K				S									
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys							
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

**AICRN-Coated SOLID CARBIDE END MILLS**  
**6 FLUTE EXTENDED LENGTH (PLAIN SHANK)**

Square **UHM90001**  
 Corner Radius **UHM92001**

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : INCH

OD (D1)	SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Square End EDP No.	Corner Radius					
							.030 EDP No.	.060 EDP No.	.090 EDP No.	.125 EDP No.	.190 EDP No.	.250 EDP No.
1/4	1/4	3/8	3/4	4	.230	UHM90001	UHM92001	UHM92029				
		3/8	1 1/8	4	.230	UHM90002	UHM92002	UHM92030				
		3/8	2 1/8	4	.230	UHM90003	UHM92003	UHM92031				
3/8	3/8	1/2	1 1/8	4	.344	UHM90004	UHM92004	UHM92032	UHM92057			
		1/2	2 1/8	4	.344	UHM90005	UHM92005	UHM92033	UHM92058			
		1/2	3 1/8	5	.344	UHM90006	UHM92006	UHM92034	UHM92059			
		1/2	3 1/8	6	.344	UHM90007	UHM92007	UHM92035	UHM92060			
		1/2	4 1/8	6	.344	UHM90008	UHM92008	UHM92036	UHM92061			
1/2	1/2	5/8	1 1/2	4	.461	UHM90009	UHM92009	UHM92037	UHM92062	UHM92082		
		5/8	2 1/4	4	.461	UHM90010	UHM92010	UHM92038	UHM92063	UHM92083		
		5/8	3 3/8	5	.461	UHM90011	UHM92011	UHM92039	UHM92064	UHM92084		
		5/8	3 3/8	6	.461	UHM90012	UHM92012	UHM92040	UHM92065	UHM92085		
		5/8	4 1/8	6	.461	UHM90013	UHM92013	UHM92041	UHM92066	UHM92086		
5/8	5/8	3/4	1 5/8	4	.586	UHM90014	UHM92014	UHM92042	UHM92067	UHM92087		
		3/4	2 3/8	5	.586	UHM90015	UHM92015	UHM92043	UHM92068	UHM92088		
		3/4	3 3/8	5	.586	UHM90016	UHM92016	UHM92044	UHM92069	UHM92089		
		3/4	2 3/8	6	.586	UHM90017	UHM92017	UHM92045	UHM92070	UHM92090		
		3/4	3 3/8	6	.586	UHM90018	UHM92018	UHM92046	UHM92071	UHM92091		
		3/4	4 1/8	6	.586	UHM90019	UHM92019	UHM92047	UHM92072	UHM92092		
3/4	3/4	1 1/8	2	4	.711	UHM90020	UHM92020	UHM92048	UHM92073	UHM92093	UHM92102	UHM92111
		1 1/8	2 5/8	5	.711	UHM90021	UHM92021	UHM92049	UHM92074	UHM92094	UHM92103	UHM92112
		1 1/8	3 1/4	6	.711	UHM90022	UHM92022	UHM92050	UHM92075	UHM92095	UHM92104	UHM92113
		1 1/8	4 1/4	7	.711	UHM90023	UHM92023	UHM92051	UHM92076	UHM92096	UHM92105	UHM92114
1	1	1 1/4	2 1/4	4	.961	UHM90024	UHM92024	UHM92052	UHM92077	UHM92097	UHM92106	UHM92115
		1 1/4	2 5/8	5	.961	UHM90025	UHM92025	UHM92053	UHM92078	UHM92098	UHM92107	UHM92116
		1 1/4	3 1/4	6	.961	UHM90026	UHM92026	UHM92054	UHM92079	UHM92099	UHM92108	UHM92117
		1 1/4	4 1/4	7	.961	UHM90027	UHM92027	UHM92055	UHM92080	UHM92100	UHM92109	UHM92118
		1 1/4	5 1/4	8	.961	UHM90028	UHM92028	UHM92056	UHM92081	UHM92101	UHM92110	UHM92119

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M			K				S									
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	Heat Resistant Super Alloys				Titanium Alloys					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	15	30	25	38	34			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	200	280	250	350	320	400 Rm	1050 Rm	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○



## **Contact us**

---

Whatsapp/Phone:+86-17751431365

Email:mannie@huanatools.com

Website:www.hncarbide.eu

Add:15# YueFeng Road, Zhangjiagang Economic Development Zone, Jiangsu Province, China