

**PRO-X**

KESİCİ TAKIMLAR KATALOĐU







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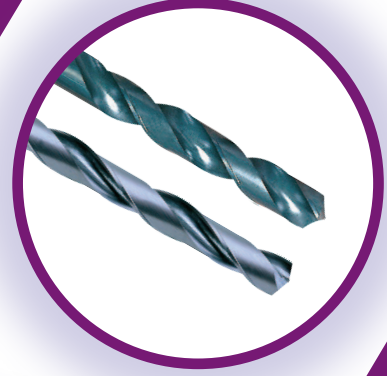




**PRO-X**

MATKAPLAR  
DRILLS

1



1

**MATKAPLAR  
DRILLS**

# HSS, SİLİNDİRİK SAPLI MATKAP UCU

## HSS, STRAIGHT SHANK TWIST DRILLS

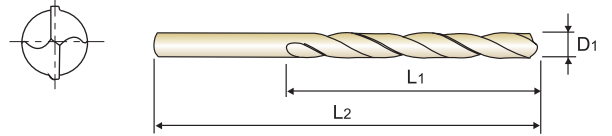
► **Yüzey Uygulaması:** Parlak Yüzey

► **Kullanım Yerleri** : Çelik , alaşımlı ve alaşımsız çelik döküm, gri dökme demir , dövülebilir dökme demir ve grafit  
: İsteğe göre buhar menevişli kaplama seçeneği

► **Surface treatment** : Bright Finish

► **Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron and graphite.

: Black oxide finish is available on request



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-1010	1.0	12	34
PMA-1011	1.1	14	36
PMA-1012	1.2	16	38
PMA-1013	1.3	18	38
PMA-1014	1.4	18	40
PMA-1015	1.5	20	40
PMA-1016	1.6	20	43
PMA-1017	1.7	22	43
PMA-1018	1.8	22	46
PMA-1019	1.9	24	49
PMA-1020	2.0	24	49
PMA-1021	2.1	24	49
PMA-1022	2.2	27	53
PMA-1023	2.3	27	53
PMA-1024	2.4	30	57
PMA-1025	2.5	30	57
PMA-1026	2.6	30	57
PMA-1027	2.7	33	61
PMA-1028	2.8	33	61
PMA-1029	2.9	33	61
PMA-1030	3.0	33	61
PMA-1031	3.1	36	65
PMA-1032	3.2	36	65
PMA-1033	3.3	36	65
PMA-1034	3.4	39	70
PMA-1035	3.5	39	70
PMA-1036	3.6	39	70
PMA-1037	3.7	39	70
PMA-1038	3.8	43	75
PMA-1039	3.9	43	75
PMA-1040	4.0	43	75
PMA-1041	4.1	43	75
PMA-1042	4.2	43	75
PMA-1043	4.3	47	80

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-1044	4.4	47	80
PMA-1045	4.5	47	80
PMA-1046	4.6	47	80
PMA-1047	4.7	47	80
PMA-1048	4.8	52	86
PMA-1049	4.9	52	86
PMA-1050	5.0	52	86
PMA-1051	5.1	52	86
PMA-1052	5.2	52	86
PMA-1053	5.3	52	86
PMA-1054	5.4	57	93
PMA-1055	5.5	57	93
PMA-1056	5.6	57	93
PMA-1057	5.7	57	93
PMA-1058	5.8	57	93
PMA-1059	5.9	57	93
PMA-1060	6.0	57	93
PMA-1061	6.1	63	101
PMA-1062	6.2	63	101
PMA-1063	6.3	63	101
PMA-1064	6.4	63	101
PMA-1065	6.5	63	101
PMA-1066	6.6	63	101
PMA-1067	6.7	63	101
PMA-1068	6.8	69	109
PMA-1069	6.9	69	109
PMA-1070	7.0	69	109
PMA-1071	7.1	69	109
PMA-1072	7.2	69	109
PMA-1073	7.3	69	109
PMA-1074	7.4	69	109
PMA-1075	7.5	69	109
PMA-1076	7.6	75	117
PMA-1077	7.7	75	117

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55-								
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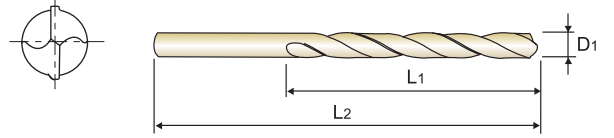
## HSS, SİLİNDİRİK SAPLI MATKAP UCU HSS, STRAIGHT SHANK TWIST DRILLS

► **Yüzey Uygulaması:** Parlak Yüzey

► **Kullanım Yerleri** : Çelik , alaşımlı ve alaşımsız çelik döküm, gri dökme demir , dövülebilir dökme demir ve grafit  
: İsteğe göre buhar menevişli kaplama seçeneği

► **Surface treatment** : Bright Finish

► **Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron and graphite.  
: Black oxide finish is available on request



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-1078	7.8	75	117
PMA-1079	7.9	75	117
PMA-1080	8.0	75	117
PMA-1081	8.1	75	117
PMA-1082	8.2	75	117
PMA-1083	8.3	75	117
PMA-1084	8.4	75	117
PMA-1085	8.5	75	117
PMA-1086	8.6	81	125
PMA-1087	8.7	81	125
PMA-1088	8.8	81	125
PMA-1089	8.9	81	125
PMA-1090	9.0	81	125
PMA-1091	9.1	81	125
PMA-1092	9.2	81	125
PMA-1093	9.3	81	125
PMA-1094	9.4	81	125
PMA-1095	9.5	81	125
PMA-1096	9.6	87	133
PMA-1097	9.7	87	133
PMA-1098	9.8	87	133
PMA-1099	9.9	87	133
PMA-1100	10.0	87	133
PMA-1101	10.1	87	133
PMA-1102	10.2	87	133
PMA-1103	10.3	87	133
PMA-1104	10.4	87	133
PMA-1105	10.5	87	133
PMA-1106	10.6	87	133
PMA-1107	10.7	94	142
PMA-1108	10.8	94	142
PMA-1109	10.9	94	142
PMA-1110	11.0	94	142
PMA-1111	11.1	94	142

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-1112	11.2	94	142
PMA-1113	11.3	94	142
PMA-1114	11.4	94	142
PMA-1115	11.5	94	142
PMA-1116	11.6	94	142
PMA-1117	11.7	94	142
PMA-1118	11.8	94	142
PMA-1119	11.9	101	151
PMA-1120	12.0	101	151
PMA-1121	12.1	101	151
PMA-1122	12.2	101	151
PMA-1123	12.3	101	151
PMA-1124	12.4	101	151
PMA-1125	12.5	101	151
PMA-1126	12.6	101	151
PMA-1127	12.7	101	151
PMA-1128	12.8	101	151
PMA-1129	12.9	101	151
PMA-1130	13.0	101	151
PMA-1135	13.5	108	160
PMA-1140	14.0	108	160
PMA-1145	14.5	114	169
PMA-1150	15.0	114	169
PMA-1155	15.5	120	178
PMA-1160	16.0	120	178
PMA-1165	16.5	125	184
PMA-1170	17.0	125	184
PMA-1175	17.5	130	191
PMA-1180	18.0	130	191
PMA-1185	18.5	135	198
PMA-1190	19.0	135	198
PMA-1195	19.5	140	205
PMA-1200	20.0	140	205

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55-								
©	©				○	○	○	○	○			

## HSSCo8 SİLİNDİRİK SAPLI UZUN MATKAP UCU

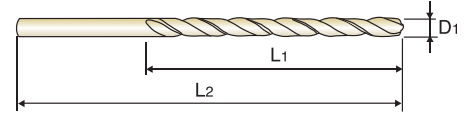
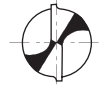
### HSSCo8, STRAIGHT SHANK TWIST DRILLS

► **Yüzey Uygulaması:** Altın renkli

► **Surface treatment :** Coloring (gold color)

► **Kullanım Yerleri :** Titanyum, inkonel gibi kesmesi zor malzemelerin işlenmesi ve paslanmaz çelik gibi malzemelerde derin delikler açılması

► **Application :** Drilling deep holes in stainless steels and difficult to cut materials such as titanium and inconel.



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-8020	2.0	56	85
PMA-8021	2.1	56	85
PMA-8022	2.2	59	90
PMA-8023	2.3	59	90
PMA-8024	2.4	62	95
PMA-8025	2.5	62	95
PMA-8026	2.6	62	95
PMA-8027	2.7	66	100
PMA-8028	2.8	66	100
PMA-8029	2.9	66	100
PMA-8030	3.0	66	100
PMA-8031	3.1	69	106
PMA-8032	3.2	69	106
PMA-8033	3.3	69	106
PMA-8034	3.4	73	112
PMA-8035	3.5	73	112
PMA-8036	3.6	73	112
PMA-8037	3.7	73	112
PMA-8038	3.8	78	119
PMA-8039	3.9	78	119
PMA-8040	4.0	78	119
PMA-8041	4.1	78	119
PMA-8042	4.2	78	119
PMA-8043	4.3	82	126
PMA-8044	4.4	82	126
PMA-8045	4.5	82	126
PMA-8046	4.6	82	126

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-8047	4.7	82	126
PMA-8048	4.8	87	132
PMA-8049	4.9	87	132
PMA-8050	5.0	87	132
PMA-8051	5.1	87	132
PMA-8052	5.2	87	132
PMA-8053	5.3	87	132
PMA-8054	5.4	91	139
PMA-8055	5.5	91	139
PMA-8056	5.6	91	139
PMA-8057	5.7	91	139
PMA-8058	5.8	91	139
PMA-8059	5.9	91	139
PMA-8060	6.0	91	139
PMA-8061	6.1	97	148
PMA-8062	6.2	97	148
PMA-8063	6.3	97	148
PMA-8064	6.4	97	148
PMA-8065	6.5	97	148
PMA-8066	6.6	97	148
PMA-8067	6.7	97	148
PMA-8068	6.8	102	156
PMA-8069	6.9	102	156
PMA-8070	7.0	102	156
PMA-8071	7.1	102	156
PMA-8072	7.2	102	156
PMA-8073	7.3	102	156

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55~								
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## HSSCo8 SİLİNDİRİK SAPLI UZUN MATKAP UCU

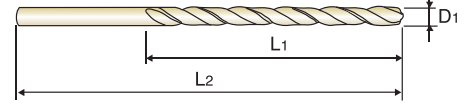
### HSSCo8, STRAIGHT SHANK TWIST DRILLS

► **Yüzey Uygulaması:** Altın renkli

► **Surface treatment :** Coloring (gold color)

► **Kullanım Yerleri :** Titanyum, inkonel gibi kesmesi zor malzemelerin işlenmesi ve paslanmaz çelik gibi malzemelerde derin delikler açılması

► **Application :** Drilling deep holes in stainless steels and difficult to cut materials such as titanium and inconel.



DIN  
340

HSS  
Co8

N  
33°

h8

135°



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-8074	7.4	102	156
PMA-8075	7.5	102	156
PMA-8076	7.6	109	165
PMA-8077	7.7	109	165
PMA-8078	7.8	109	165
PMA-8079	7.9	109	165
PMA-8080	8.0	109	165
PMA-8081	8.1	109	165
PMA-8082	8.2	109	165
PMA-8083	8.3	109	165
PMA-8084	8.4	109	165
PMA-8085	8.5	109	165
PMA-8086	8.6	115	175
PMA-8087	8.7	115	175
PMA-8088	8.8	115	175
PMA-8089	8.9	115	175
PMA-8090	9.0	115	175
PMA-8091	9.1	115	175

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-8092	9.2	115	175
PMA-8093	9.3	115	175
PMA-8094	9.4	115	175
PMA-8095	9.5	115	175
PMA-8096	9.6	121	184
PMA-8097	9.7	121	184
PMA-8098	9.8	121	184
PMA-8099	9.9	121	184
PMA-8100	10.0	121	184
PMA-8102	10.2	121	184
PMA-8105	10.5	121	184
PMA-8108	10.8	128	195
PMA-8110	11.0	128	195
PMA-8112	11.2	128	195
PMA-8115	11.5	128	195
PMA-8118	11.8	128	195
PMA-8120	12.0	134	205

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55-								
©	©				○	○	©	○	○			

TAVSİYE EDİLEN KESME DEĞERLERİ

RECOMMENDED CUTTING CONDITIONS

PMA - 1000 / 8000 SERİSİ

MALZEME	KARBON ÇELİĞİ		KARBON ÇELİĞİ		KARBON ÇELİĞİ		ALAŞIMLI ÇELİKLER		ALAŞIMLI ÇELİKLER		PASLANMAZ ÇELİK		TİTANYUM	
SERTLİK			~ HRc23		~ HRc23 ~ 28		HRc23 ~ 34		HRc34 ~ 38		HRc23			
GÜÇ*	~ 570 N/mm <sup>2</sup>		~ 830 N/mm <sup>2</sup>		830 ~ 950 N/mm <sup>2</sup>		830 ~ 1110 N/mm <sup>2</sup>		1110 ~ 1260 N/mm <sup>2</sup>		830 N/mm <sup>2</sup>		410 N/mm <sup>2</sup>	
DELME HIZI	22 ~ 27 m/min		15 ~ 20 m/min		10 ~ 15 m/min		15 ~ 20 m/min		8 ~ 12 m/min		15 ~ 20 m/min		8 ~ 12 m/min	
ÇAP	N	S	N	S	N	S	N	S	N	S	N	S	N	S
2.5	3380	0.025	2550	0.025	1900	0.015	2380	0.020	1400	0.015	2550	0.025	1400	0.020
3.0	2700	0.050	2000	0.050	1500	0.025	1880	0.050	1100	0.020	2000	0.050	1100	0.025
5.0	1700	0.063	1280	0.063	960	0.038	1190	0.063	700	0.025	1280	0.063	700	0.038
8.0	1050	0.130	780	0.130	590	0.076	730	0.130	430	0.038	780	0.130	430	0.076
11.0	750	0.150	560	0.150	425	0.076	520	0.180	310	0.050	560	0.150	430	0.076
19.0	440	0.230	330	0.230	255	0.130	300	0.230	180	0.050	330	0.230	180	0.130
31.0	260	0.280	195	0.280	145	0.180	180	0.280	107	0.076	195	0.280	107	0.180

WORK MATERIAL	TOOL STEELS		CAST IRON		ALUMINUM ALLOYS		MAGNEZYUM ALAŞIMLARI		ZINC ALLOYS		PLASTİK	
SERTLİK			~ HRc21									
GÜÇ*	~ 270 N/mm <sup>2</sup>		~ 800 N/mm <sup>2</sup>									
DELME HIZI	20 ~ 25 m/min		15 ~ 20 m/min		45 ~ 50 m/min		55 ~ 65 m/min		40 ~ 50 m/min		20 ~ 25 m/min	
ÇAP	N	S	N	S	N	S	N	S	N	S	N	S
2.5	3180	0.042	2250	0.025	6400	0.038	8600	0.038	6400	0.038	3380	0.025
3.0	2500	0.050	2000	0.050	5000	0.063	6800	0.063	5000	0.063	2700	0.050
5.0	1590	0.063	1280	0.063	3200	0.076	4300	0.076	3200	0.076	1700	0.063
8.0	970	0.130	780	0.130	2000	0.180	2600	0.180	2000	0.180	1050	0.130
11.0	700	0.180	560	0.150	1400	0.200	1900	0.200	1400	0.200	750	0.150
19.0	440	0.230	330	0.230	820	0.300	1100	0.300	820	0.300	440	0.230
31.0	240	0.300	195	0.280	490	0.380	660	0.380	490	0.380	260	0.280

N= Devir  
S= Devir başına ilerleme (mm/ devir)

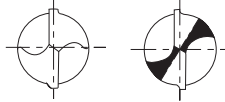


## HSS-E SİLİNDİRİK SAPLI, KAPLAMALI MATKAP UCU

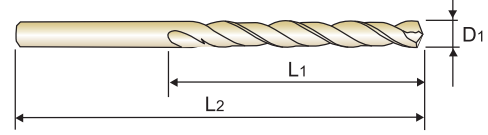
### HSS-E STRAIGHT SHANK DRILLS, COATED

- **Kesme Geometrisi:** Sağ yönlü helis
- **Uç Açısı** : 135° 1.6 mm altında Normal uç, 1.6 mm ve üzerinde Bölünmüş uç
- **Yüzey Uygulaması:** Parlak gövde , sadece çalışan bölgenin TiN kaplaması
- **Kullanım Yerleri** : paslanmaz çelikler , titanyum alaşımları veta inkonel gibi zor işlenen malzemelerde.

- **Flute Geometry** : Right hand helix
- **Point Angle** : 135°, under 1.6mm : Normal point  
1.6mm & over : Split point
- **Surface treatment** : Bright body, TiN coating on working area
- **Application** : Drilling stainless steels, difficult to cut materials such as titanium alloys and inconel.



1.6 mm altında 1.6 mm ve üzeri



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-2010	1.0	12	34
PMA-2011	1.1	14	36
PMA-2012	1.2	16	38
PMA-2013	1.3	16	38
PMA-2014	1.4	18	40
PMA-2015	1.5	18	40
PMA-2016	1.6	20	43
PMA-2017	1.7	20	43
PMA-2018	1.8	22	46
PMA-2019	1.9	22	46
PMA-2020	2.0	24	49
PMA-2021	2.1	24	49
PMA-2022	2.2	27	53
PMA-2023	2.3	27	53
PMA-2024	2.4	30	57
PMA-2025	2.5	30	57
PMA-2026	2.6	30	57
PMA-2027	2.7	33	61
PMA-2028	2.8	33	61
PMA-2029	2.9	33	61
PMA-2030	3.0	33	61
PMA-2031	3.1	36	65
PMA-2032	3.2	36	65
PMA-2033	3.3	36	65
PMA-2034	3.4	39	70
PMA-2035	3.5	39	70
PMA-2036	3.6	39	70
PMA-2037	3.7	39	70
PMA-2038	3.8	43	75
PMA-2039	3.9	43	75
PMA-2040	4.0	43	75

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-2041	4.1	43	75
PMA-2042	4.2	43	75
PMA-2043	4.3	47	80
PMA-2044	4.4	47	80
PMA-2045	4.5	47	80
PMA-2046	4.6	47	80
PMA-2047	4.7	47	80
PMA-2048	4.8	52	86
PMA-2049	4.9	52	86
PMA-2050	5.0	52	86
PMA-2051	5.1	52	86
PMA-2052	5.2	52	86
PMA-2053	5.3	52	86
PMA-2054	5.4	57	93
PMA-2055	5.5	57	93
PMA-2056	5.6	57	93
PMA-2057	5.7	57	93
PMA-2058	5.8	57	93
PMA-2059	5.9	57	93
PMA-2060	6.0	57	93
PMA-2061	6.1	63	101
PMA-2062	6.2	63	101
PMA-2063	6.3	63	101
PMA-2064	6.4	63	101
PMA-2065	6.5	63	101
PMA-2066	6.6	63	101
PMA-2067	6.7	63	101
PMA-2068	6.8	69	109
PMA-2069	6.9	69	109
PMA-2070	7.0	69	109
PMA-2071	7.1	69	109

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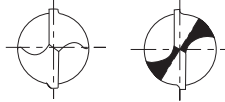
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55~								
©	©					○	○	○	○			

## HSS-E SİLİNDİRİK SAPLI, KAPLAMALI MATKAP UCU

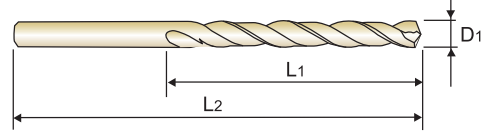
### HSS-E STRAIGHT SHANK DRILLS, COATED

- **Kesme Geometrisi:** Sağ yönlü helis
- **Uç Açısı** : 135° 1.6 mm altında Normal uç, 1.6 mm ve üzerinde Bölünmüş uç
- **Yüzey Uygulaması:** Parlak gövde , sadece çalışan bölgenin TiN kaplaması
- **Kullanım Yerleri** : paslanmaz çelikler , titanyum alaşımları veta inkonel gibi zor işlenen malzemelerde.

- **Flute Geometry** : Right hand helix
- **Point Angle** : 135°, under 1.6mm : Normal point  
1.6mm & over : Split point
- **Surface treatment** : Bright body, TiN coating on working area
- **Application** : Drilling stainless steels, difficult to cut materials such as titanium alloys and inconel.



1.6 mm altında 1.6 mm ve üzeri



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-2072	7,2	69	109
PMA-2073	7,3	69	109
PMA-2074	7,4	69	109
PMA-2075	7,5	69	109
PMA-2076	7,6	75	117
PMA-2077	7,7	75	117
PMA-2078	7,8	75	117
PMA-2079	7,9	75	117
PMA-2080	8,0	75	117
PMA-2081	8,1	75	117
PMA-2082	8,2	75	117
PMA-2083	8,3	75	117
PMA-2084	8,4	75	117
PMA-2085	8,5	75	117
PMA-2086	8,6	81	125
PMA-2087	8,7	81	125
PMA-2088	8,8	81	125
PMA-2089	8,9	81	125
PMA-2090	9,0	81	125
PMA-2091	9,1	81	125
PMA-2092	9,2	81	125
PMA-2093	9,3	81	125
PMA-2094	9,4	81	125
PMA-2095	9,5	81	125
PMA-2096	9,6	87	133
PMA-2097	9,7	87	133
PMA-2098	9,8	87	133
PMA-2099	9,9	87	133
PMA-2100	10,0	87	133

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-2101	10,1	87	133
PMA-2102	10,2	87	133
PMA-2103	10,3	87	133
PMA-2104	10,4	87	133
PMA-2105	10,5	87	133
PMA-2106	10,6	87	133
PMA-2107	10,7	94	142
PMA-2108	10,8	94	142
PMA-2109	10,9	94	142
PMA-2110	11,0	94	142
PMA-2111	11,1	94	142
PMA-2112	11,2	94	142
PMA-2113	11,3	94	142
PMA-2114	11,4	94	142
PMA-2115	11,5	94	142
PMA-2116	11,6	94	142
PMA-2117	11,7	94	142
PMA-2118	11,8	94	142
PMA-2119	11,9	101	151
PMA-2120	12,0	101	151
PMA-2121	12,1	101	151
PMA-2122	12,2	101	151
PMA-2123	12,3	101	151
PMA-2124	12,4	101	151
PMA-2125	12,5	101	151
PMA-2126	12,6	101	151
PMA-2127	12,7	101	151
PMA-2128	12,8	101	151
PMA-2129	12,9	101	151
PMA-2130	13,0	101	151

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55~								
©	©					○	○	○	○			



**TAVSİYE EDİLEN KESME DEĞERLERİ**  
**RECOMMENDED CUTTING CONDITIONS**

**PMA-2000 SERİSİ**

MALZEME	KARBON ÇELİĞİ	KARBON ÇELİĞİ		KARBON ÇELİĞİ		ALAŞIMLI ÇELİKLER		ALAŞIMLI ÇELİKLER		PASLANMAZ ÇELİK		TİTANYUM		
SERTLİK		~ HRc23		~ HRc23 ~ 28		HRc23 ~ 34		HRc34 ~ 38		HRc23				
GÜÇ*	~ 570 N/mm <sup>2</sup>	~ 830 N/mm <sup>2</sup>		830 ~ 950 N/mm <sup>2</sup>		830 ~ 1110 N/mm <sup>2</sup>		1110 ~ 1260 N/mm <sup>2</sup>		830 N/mm <sup>2</sup>		410 N/mm <sup>2</sup>		
DELME HIZI	22 ~ 27 m/min	15 ~ 20 m/min		10 ~ 15 m/min		15 ~ 20 m/min		8 ~ 12 m/min		15 ~ 20 m/min		8 ~ 12 m/min		
ÇAP	N	S	N	S	N	S	N	S	N	S	N	S	N	S
2.5	3380	0.025	2550	0.025	1900	0.015	2380	0.020	1400	0.015	2550	0.025	1400	0.020
3.0	2700	0.050	2000	0.050	1500	0.025	1880	0.050	1100	0.020	2000	0.050	1100	0.025
5.0	1700	0.063	1280	0.063	960	0.038	1190	0.063	700	0.025	1280	0.063	700	0.038
8.0	1050	0.130	780	0.130	590	0.076	730	0.130	430	0.038	780	0.130	430	0.076
11.0	750	0.150	560	0.150	425	0.076	520	0.180	310	0.050	560	0.150	430	0.076
19.0	440	0.230	330	0.230	255	0.130	300	0.230	180	0.050	330	0.230	180	0.130
31.0	260	0.280	195	0.280	145	0.180	180	0.280	107	0.076	195	0.280	107	0.180

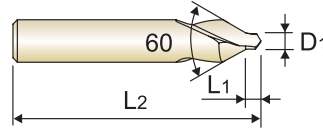
MALZEME	TAKIM ÇELİĞİ		DÖKME DEMİR		ALÜMİNYUM ALAŞIMLARI		MAGNEZYUM ALAŞIMLARI		ÇİNKO ALAŞIMLARI		PLASTİKLER	
SERTLİK			~ HRc21									
GÜÇ*	~ 270 N/mm <sup>2</sup>		~ 800 N/mm <sup>2</sup>									
DELME HIZI	20 ~ 25 m/min		15 ~ 20 m/min		45 ~ 50 m/min		55 ~ 65 m/min		40 ~ 50 m/min		20 ~ 25 m/min	
ÇAP	N	S	N	S	N	S	N	S	N	S	N	S
2.5	3180	0.042	2250	0.025	6400	0.038	8600	0.038	6400	0.038	3380	0.025
3.0	2500	0.050	2000	0.050	5000	0.063	6800	0.063	5000	0.063	2700	0.050
5.0	1590	0.063	1280	0.063	3200	0.076	4300	0.076	3200	0.076	1700	0.063
8.0	970	0.130	780	0.130	2000	0.180	2600	0.180	2000	0.180	1050	0.130
11.0	700	0.180	560	0.150	1400	0.200	1900	0.200	1400	0.200	750	0.150
19.0	440	0.230	330	0.230	820	0.300	1100	0.300	820	0.300	440	0.230
31.0	240	0.300	195	0.280	490	0.380	660	0.380	490	0.380	260	0.280

N= Devir  
S= Devir başına  
ilerleme (mm/  
devir)

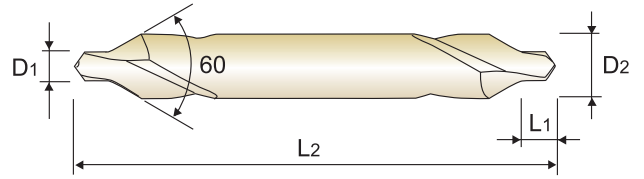
## HSS, FORM A PUNTA MATKABI HSS, CENTER DRILLS FORM A



Form A  
(D1303, Ø0.5, Ø0.8)



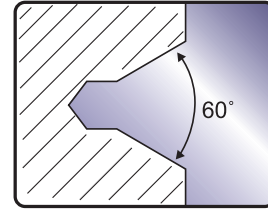
Form A  
(D1303)



### FORM A (60°)

Ölçü : mm

KOD	Matkap Çapı	Şaft Çapı	Kılavuz Boyu	Tam Boy	
	D1	D2	L1	L2	
PMA-5010	1.0	3.15	1.3	31.5	
PMA-5012	1.25	3.15	1.6	31.5	
PMA-5016	1.6	4	2	35.5	
PMA-5020	2.0	5	2.5	40	
PMA-5025	2.5	6.3	3.1	45	
PMA-5031	3.15	8	3.9	50	
PMA-5040	4.0	10	5	56	
PMA-5050	5.0	12.5	6.3	63	
PMA-5063	6.3	16	8	71	
PMA-5080	8.0	20	10.1	80	
PMA-5100	10.0	25	12.8	100	



1 mm'nin altında tek taraflı olarak üretilir.

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRc30-45	HRc45-55	HRc55-								
©	©				○	○	○	○	○	○	○	

TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS

## PMA-5000 SERİSİ

MALZEME	YUMUŞAK ÇELİK		ALAŞIMLI ÇELİKLER				PASLANMAZ ÇELİK	
SERTLİK	< 700 N/mm <sup>2</sup>		~ HRc 23		~ HRc 32			
ÇAP	HIZ	İLERLEME	HIZ	İLERLEME	HIZ	İLERLEME	HIZ	İLERLEME
2.0	30 ~ 45	0.02~0.05	25 ~ 30	0.02~0.05	15 ~ 25	0.01~0.03	6 ~ 10	0.01~0.03
3.0		0.06		0.06		0.04		0.04
6.0		0.08		0.08		0.06		0.06
10.0		0.15		0.15		0.10		0.10

HIZ (Şaft Çapı) = m/min  
İLERLEME (Matkap Çapı) = m/min



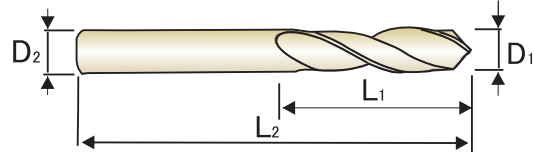
## KARBÜR MATKAPLAR CARBIDE DRILLS

► **Kullanım Yerleri** : Çelik, dökme çelik, dökme demir, kır döküm, dövülebilir dökme demir, demir dışı ağır ve hafif metaller, sert plastik.  
: İsteğe göre kaplama seçeneği

► **Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.  
: Coating is available on request



3 mm altında 3 mm ve üzeri



DIN  
6539

MG

N  
30°

h6

h7

118°



D<sub>1</sub>=D<sub>2</sub>

Ölçü : mm

KOD	Matkap Çapı D <sub>1</sub>	Kesme Kenarı Boyu L <sub>1</sub>	Tam Boy L <sub>2</sub>
PMA-7010	1,0	6	26
PMA-7011	1,1	7	28
PMA-7012	1,2	8	30
PMA-7013	1,3	9	30
PMA-7014	1,4	9	32
PMA-7015	1,5	10	32
PMA-7016	1,6	10	34
PMA-7017	1,7	10	34
PMA-7018	1,8	11	36
PMA-7019	1,9	11	36
PMA-7020	2,0	12	38
PMA-7021	2,1	12	38
PMA-7022	2,2	13	40
PMA-7023	2,3	13	40
PMA-7024	2,4	14	43
PMA-7025	2,5	14	43
PMA-7026	2,6	14	43
PMA-7027	2,7	16	46
PMA-7028	2,8	16	46
PMA-7029	2,9	16	46
PMA-7030	3,0	16	46
PMA-7031	3,1	18	49
PMA-7032	3,2	18	49
PMA-7033	3,3	18	49
PMA-7034	3,4	20	52

KOD	Matkap Çapı D <sub>1</sub>	Kesme Kenarı Boyu L <sub>1</sub>	Tam Boy L <sub>2</sub>
PMA-7035	3,5	20	52
PMA-7036	3,6	20	52
PMA-7037	3,7	20	52
PMA-7038	3,8	20	52
PMA-7039	3,9	22	55
PMA-7040	4,0	22	55
PMA-7041	4,1	22	55
PMA-7042	4,2	22	55
PMA-7043	4,3	24	58
PMA-7044	4,4	24	58
PMA-7045	4,5	24	58
PMA-7046	4,6	24	58
PMA-7047	4,7	24	58
PMA-7048	4,8	26	62
PMA-7049	4,9	26	62
PMA-7050	5,0	26	62
PMA-7051	5,1	26	62
PMA-7052	5,2	26	62
PMA-7053	5,3	26	62
PMA-7054	5,4	28	66
PMA-7055	5,5	28	66
PMA-7056	5,6	28	66
PMA-7057	5,7	28	66
PMA-7058	5,8	28	66
PMA-7059	5,9	28	66

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55-								
©	©				○	○	○	○	○			

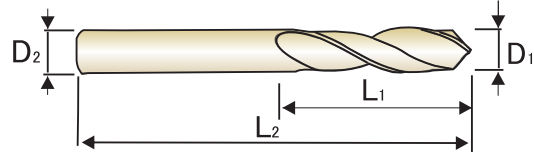
KARBÜR MATKAPLAR  
CARBIDE DRILLS

► **Kullanım Yerleri** : Çelik, dökme çelik, dökme demir, kır döküm, dövülebilir dökme demir, demir dışı ağır ve hafif metaller, sert plastik.  
: İsteğe göre kaplama seçeneği

► **Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.  
: Coating is available on request



3 mm altında 3 mm ve üzeri



D<sub>1</sub>=D<sub>2</sub>

Ölçü : mm

KOD	Matkap Çapı D <sub>1</sub>	Kesme Kenarı Boyu L <sub>1</sub>	Tam Boy L <sub>2</sub>
PMA-7060	6,0	28	66
PMA-7061	6,1	31	70
PMA-7062	6,2	31	70
PMA-7063	6,3	31	70
PMA-7064	6,4	31	70
PMA-7065	6,5	31	70
PMA-7066	6,6	31	70
PMA-7067	6,7	31	70
PMA-7068	6,8	34	74
PMA-7069	6,8	34	74
PMA-7070	6,0	34	74
PMA-7071	7,1	34	74
PMA-7072	7,2	34	74
PMA-7073	7,3	34	74
PMA-7074	7,4	34	74
PMA-7075	7,5	34	74
PMA-7076	7,6	37	78
PMA-7077	7,7	37	78
PMA-7078	7,8	37	78
PMA-7079	7,8	37	78
PMA-7080	8,0	37	79
PMA-7081	8,1	37	79
PMA-7082	8,2	37	78
PMA-7083	8,3	37	78

KOD	Matkap Çapı D <sub>1</sub>	Kesme Kenarı Boyu L <sub>1</sub>	Tam Boy L <sub>2</sub>
PMA-7084	8,4	37	79
PMA-7085	8,5	37	79
PMA-7086	8,6	40	84
PMA-7087	8,7	40	84
PMA-7088	8,8	40	84
PMA-7089	8,9	40	84
PMA-7090	9,0	40	84
PMA-7091	9,1	40	84
PMA-7092	9,2	40	84
PMA-7093	9,3	40	84
PMA-7094	9,4	40	84
PMA-7095	9,5	40	84
PMA-7096	9,6	43	89
PMA-7097	9,7	43	89
PMA-7098	9,8	43	89
PMA-7099	9,9	43	89
PMA-7100	10,0	43	89
PMA-7102	10,2	43	89
PMA-7105	10,5	43	89
PMA-7110	11	47	95
PMA-7115	11,5	47	95
PMA-7120	12	51	102
PMA-7130	13	51	102

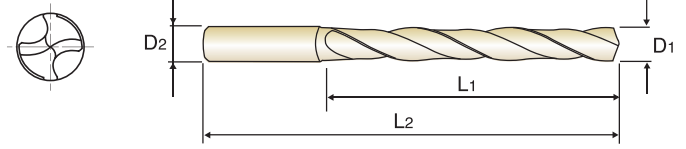
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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55-								
©	©				○	○	○	○	○			

## KAPLAMALI KARBÜR MATKAPLAR COATED CARBIDE DRILLS

► **Kullanım Yerleri** : Çelik, dökme çelik, dökme demir, kır döküm, dövülebilir dökme demir, demir dışı ağır ve hafif metaller, sert plastik.

► **Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.



DIN  
6539

MG

N  
30°

h6

h7

118°



TiAlN

D<sub>1</sub>=D<sub>2</sub>

Ölçü : mm

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>
PMA-7010C	1,0	6	26
PMA-7011C	1,1	7	28
PMA-7012C	1,2	8	30
PMA-7013C	1,3	9	30
PMA-7014C	1,4	9	32
PMA-7015C	1,5	10	32
PMA-7016C	1,6	10	34
PMA-7017C	1,7	10	34
PMA-7018C	1,8	11	36
PMA-7019C	1,9	11	36
PMA-7020C	2,0	12	38
PMA-7021C	2,1	12	38
PMA-7022C	2,2	13	40
PMA-7023C	2,3	13	40
PMA-7024C	2,4	14	43
PMA-7025C	2,5	14	43
PMA-7026C	2,6	14	43
PMA-7027C	2,7	16	46
PMA-7028C	2,8	16	46
PMA-7029C	2,9	16	46
PMA-7030C	3,0	16	46
PMA-7031C	3,1	18	49
PMA-7032C	3,2	18	49
PMA-7033C	3,3	18	49
PMA-7034C	3,4	20	52

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>
PMA-7035C	3,5	20	52
PMA-7036C	3,6	20	52
PMA-7037C	3,7	20	52
PMA-7038C	3,8	20	52
PMA-7039C	3,9	22	55
PMA-7040C	4,0	22	55
PMA-7041C	4,1	22	55
PMA-7042C	4,2	22	55
PMA-7043C	4,3	24	58
PMA-7044C	4,4	24	58
PMA-7045C	4,5	24	58
PMA-7046C	4,6	24	58
PMA-7047C	4,7	24	58
PMA-7048C	4,8	26	62
PMA-7049C	4,9	26	62
PMA-7050C	5,0	26	62
PMA-7051C	5,1	26	62
PMA-7052C	5,2	26	62
PMA-7053C	5,3	26	62
PMA-7054C	5,4	28	66
PMA-7055C	5,5	28	66
PMA-7056C	5,6	28	66
PMA-7057C	5,7	28	66
PMA-7058C	5,8	28	66
PMA-7059C	5,9	28	66

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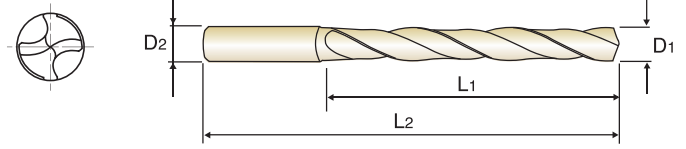
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55-								
©	©				○	○	○	○	○			



## KAPLAMALI KARBÜR MATKAPLAR COATED CARBIDE DRILLS

► **Kullanım Yerleri** : Çelik, dökme çelik, dökme demir, kır döküm, dövülebilir dökme demir, demir dışı ağır ve hafif metaller, sert plastik.

► **Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.



DIN  
6539

MG

N  
30°

h6

h7

118°

TiAlN

D<sub>1</sub>=D<sub>2</sub>

Ölçü : mm

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>
PMA-7060C	6,0	28	66
PMA-7061C	6,1	31	70
PMA-7062C	6,2	31	70
PMA-7063C	6,3	31	70
PMA-7064C	6,4	31	70
PMA-7065C	6,5	31	70
PMA-7066C	6,6	31	70
PMA-7067C	6,7	31	70
PMA-7068C	6,8	34	74
PMA-7069C	6,8	34	74
PMA-7070C	6,0	34	74
PMA-7071C	7,1	34	74
PMA-7072C	7,2	34	74
PMA-7073C	7,3	34	74
PMA-7074C	7,4	34	74
PMA-7075C	7,5	34	74
PMA-7076C	7,6	37	78
PMA-7077C	7,7	37	78
PMA-7078C	7,8	37	78
PMA-7079C	7,8	37	78
PMA-7080C	8,0	37	79
PMA-7081C	8,1	37	79
PMA-7082C	8,2	37	78
PMA-7083C	8,3	37	78

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>
PMA-7084C	8,4	37	79
PMA-7085C	8,5	37	79
PMA-7086C	8,6	40	84
PMA-7087C	8,7	40	84
PMA-7088C	8,8	40	84
PMA-7089C	8,9	40	84
PMA-7090C	9,0	40	84
PMA-7091C	9,1	40	84
PMA-7092C	9,2	40	84
PMA-7093C	9,3	40	84
PMA-7094C	9,4	40	84
PMA-7095C	9,5	40	84
PMA-7096C	9,6	43	89
PMA-7097C	9,7	43	89
PMA-7098C	9,8	43	89
PMA-7099C	9,9	43	89
PMA-7100C	10,0	43	89
PMA-7102C	10,2	43	89
PMA-7105C	10,5	43	89
PMA-7110C	11	47	95
PMA-7115C	11,5	47	95
PMA-7120C	12	51	102
PMA-7130C	13	51	102

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRc30-45	HRc45-55	HRc55-								
©	©				○	○	○	○	○			

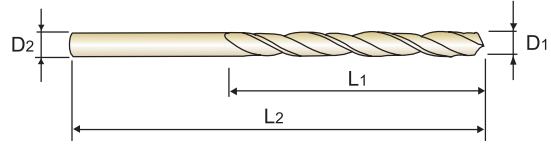
## KARBÜR MATKAPLAR CARBIDE DRILLS

► **Kullanım Yerleri** : Çelik, dökme çelik, dökme demir,  
kır döküm, dövülebilir dökme demir,  
demir dışı ağır ve hafif metaller, sert plastik.  
: İsteğe göre kaplama seçeneği

► **Application** : Drilling steels in general, cast steels, cast iron, chilled  
cast iron, malleable cast iron, non-ferrous heavy  
metals, non-ferrous light metals, abrasive plastics.  
: Coating is available on request



3 mm altında 3 mm ve üzeri



D<sub>1</sub>=D<sub>2</sub>

Ölçü : mm

KOD	Matkap Çapı D <sub>1</sub>	Kesme Kenarı Boyu L <sub>1</sub>	Tam Boy L <sub>2</sub>
PMA-6010	1.0	12	34
PMA-6011	1.1	14	36
PMA-6012	1.2	16	38
PMA-6013	1.3	16	38
PMA-6014	1.4	18	40
PMA-6015	1.5	18	40
PMA-6016	1.6	20	43
PMA-6017	1.7	20	43
PMA-6018	1.8	22	46
PMA-6018	1.8	22	46
PMA-6020	2.0	24	49
PMA-6021	2.1	24	49
PMA-6022	2.2	27	53
PMA-6023	2.3	27	53
PMA-6024	2.4	30	57
PMA-6025	2.5	30	57
PMA-6026	2.6	30	57
PMA-6027	2.7	33	61
PMA-6028	2.8	33	61
PMA-6028	2.8	33	61
PMA-6030	3.0	33	61
PMA-6031	3.1	36	65

KOD	Matkap Çapı D <sub>1</sub>	Kesme Kenarı Boyu L <sub>1</sub>	Tam Boy L <sub>2</sub>
PMA-6032	3.2	36	65
PMA-6033	3.3	36	65
PMA-6034	3.4	39	70
PMA-6035	3.5	39	70
PMA-6036	3.6	39	70
PMA-6037	3.7	39	70
PMA-6038	3.8	43	75
PMA-6038	3.9	43	75
PMA-6040	4.0	43	75
PMA-6041	4.1	43	75
PMA-6042	4.2	43	75
PMA-6043	4.3	47	80
PMA-6044	4.4	47	80
PMA-6045	4.5	47	80
PMA-6046	4.6	47	80
PMA-6047	4.7	47	80
PMA-6048	4.8	52	86
PMA-6048	4.9	52	86
PMA-6050	5.0	52	86
PMA-6051	5.1	52	86
PMA-6052	5.2	52	86
PMA-6053	5.3	52	86

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55-								
©	©				○	○	○	○	○			

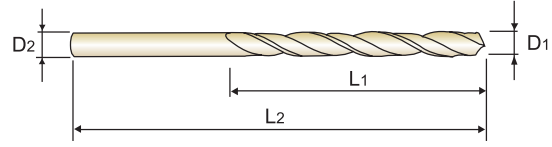
## KARBÜR MATKAPLAR CARBIDE DRILLS

► **Kullanım Yerleri** : Çelik, dökme çelik, dökme demir, kır döküm, dövülebilir dökme demir, demir dışı ağır ve hafif metaller, sert plastik.  
: İsteğe göre kaplama seçeneği

► **Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.  
: Coating is available on request



3 mm altında 3 mm ve üzeri



$D_1=D_2$

Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-6054	5,4	57	93
PMA-6055	5,5	57	93
PMA-6056	5,6	57	93
PMA-6057	5,7	57	93
PMA-6058	5,8	57	93
PMA-6059	5,9	57	93
PMA-6060	6,0	57	93
PMA-6061	6,1	63	101
PMA-6062	6,2	63	101
PMA-6063	6,3	63	101
PMA-6064	6,4	63	101
PMA-6065	6,5	63	101
PMA-6066	6,6	69	109
PMA-6067	6,7	69	109
PMA-6068	6,8	69	109
PMA-6069	6,9	69	109
PMA-6070	7	69	109
PMA-6071	7,1	69	109
PMA-6072	7,2	69	109
PMA-6073	7,3	69	109
PMA-6074	7,4	69	109
PMA-6075	7,5	69	109
PMA-6076	7,6	75	117
PMA-6077	7,7	75	117
PMA-6078	7,8	75	117
PMA-6079	7,9	75	117
PMA-6080	8	75	117

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2
PMA-6081	8,1	75	117
PMA-6082	8,2	75	117
PMA-6083	8,3	75	117
PMA-6084	8,4	75	117
PMA-6085	8,5	75	117
PMA-6086	8,6	81	125
PMA-6087	8,7	81	125
PMA-6088	8,8	81	125
PMA-6089	8,9	81	125
PMA-6090	9	81	125
PMA-6091	9,1	81	125
PMA-6092	9,2	81	125
PMA-6093	9,3	81	125
PMA-6094	9,4	81	125
PMA-6095	9	81	125
PMA-6096	9,6	87	133
PMA-6097	9,7	87	133
PMA-6098	9,8	87	133
PMA-6099	9,9	87	133
PMA-6100	10	87	133
PMA-6102	10,2	87	133
PMA-6105	10,5	87	133
PMA-6110	11	94	142
PMA-6115	11,5	94	142
PMA-6120	12	101	151
PMA-6125	12,5	101	151
PMA-6130	13	101	151

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
-HB225	HB225-325	HRC30-45	HRC45-55	HRC55-								
©	©				○	○	○	○	○			

## TAVSİYE EDİLEN KESME DEĞERLERİ

## RECOMMENDED CUTTING CONDITIONS

## PMA - 6000 / 7000 SERİSİ

MALZEME	ALAŞIMSIZ ÇELİKLER		ALAŞIMLI ÇELİKLER		YUMUŞAK GRİ DÖKME DEMİR		SERT GERİ DÖKME DEMİR	
SERTLİK	< 700 N/mm <sup>2</sup>		< 1000 N/mm <sup>2</sup>		< HB240, GG25		< HB300, GG40	
DELME HIZI	65 ~ 75 m/min		45 ~ 55 m/min		80 ~ 100 m/min		50 ~ 70 m/min	
ÇAP	N	S	N	S	N	S	N	S
1.0	23000	0.03	17200	0.03	32000	0.04	23000	0.04
2.0	11500	0.04	8600	0.04	16000	0.05	11500	0.05
3.0	7800	0.05	5750	0.05	10500	0.06	7600	0.06
4.0	5800	0.06	4300	0.06	7800	0.07	5700	0.07
5.0	4700	0.07	3450	0.07	6200	0.08	4550	0.08
6.0	3900	0.08	2850	0.08	5200	0.09	3800	0.09
7.0	3350	0.09	2450	0.09	4500	0.10	3250	0.10
8.0	2900	0.10	2150	0.10	3900	0.12	2850	0.12
9.0	2600	0.11	1900	0.11	3450	0.14	2550	0.14
10.0	2350	0.12	1700	0.12	3100	0.16	2300	0.16
11.0	2150	0.13	1600	0.13	2850	0.18	2100	0.18
12.0	1950	0.14	1450	0.14	2600	0.20	1900	0.20
13.0	1800	0.16	1350	0.16	2400	0.20	1750	0.20

MALZEME	PASLANMAZ ÇELİK		AL-Sİ ALAŞIMLARI, Sİ<10%		AL-Sİ ALAŞIMLARI, Sİ>10%		Tİ, Nİ ALAŞIMLI ÇELİKLER	
SERTLİK	-		-		-		-	
DELME HIZI	30 ~ 40 m/min		150 ~ 170 m/min		110 ~ 130 m/min		33 ~ 38 m/min	
ÇAP	N	S	N	S	N	S	N	S
1.0	12000	0.04	54000	0.05	42000	0.05	11800	0.02
2.0	6000	0.03	27000	0.06	21000	0.06	5900	0.03
3.0	4000	0.04	18000	0.07	14000	0.07	3900	0.04
4.0	3000	0.05	13000	0.08	10500	0.08	2950	0.05
5.0	2400	0.06	10500	0.09	8500	0.09	2350	0.06
6.0	2000	0.07	8800	0.11	7100	0.11	1950	0.07
7.0	1700	0.08	7600	0.13	6100	0.13	1700	0.08
8.0	1500	0.09	6600	0.15	5350	0.15	1450	0.09
9.0	1350	0.10	5900	0.17	4750	0.17	1300	0.10
10.0	1200	0.11	5300	0.19	4250	0.19	1200	0.11
11.0	1100	0.12	4850	0.21	3900	0.21	1050	0.12
12.0	1000	0.13	4450	0.23	3550	0.23	980	0.13
13.0	950	0.13	4100	0.25	3300	0.25	905	0.13

Kesme değerleri kaplamalı ürünlerde %20 oranında artırılabilir.

N= Devir

S= Devir başına ilerleme (mm/devir)



**PRO-X**



**2**

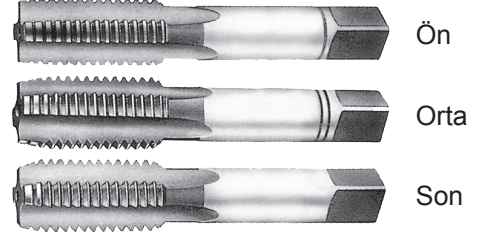
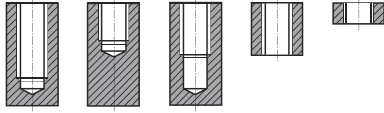
**KILAVUZLAR  
TAPS**

## 3'LÜ TAKIM EL KILAVUZU - DIN 352 HSS

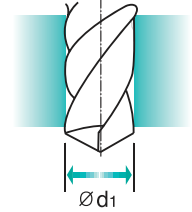
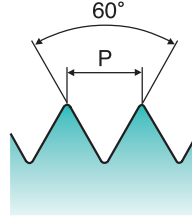
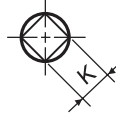
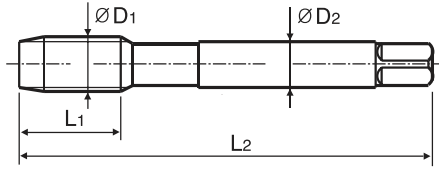
### HAND TAPS - DIN 352 HSS

- Ön, orta ve son kılavuzdan oluşan el kılavuzu setidir. Son kılavuz makina kılavuzu olarak da kullanılır.
- This tap is a serial hand tap in set, First, Second and Bottoming. Bottoming tap of set has final internal thread dimensions only.

Delik Tipi



Kılavuz Seti  
Sets of taps



Ölçü : mm

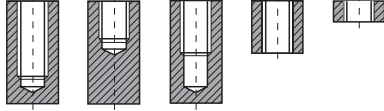
ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	x 0.4	PKI-1M2	8	36	2.8	2.1	1.6	
M2.2	x 0.45	PKI-1M2N2	9	36	2.8	2.1	1.75	
M2.3	x 0.4	PKI-1M2N3	9	36	2.8	2.1	1.9	
M2.5	x 0.45	PKI-1M2N5	9	40	2.8	2.1	2.05	
M2.6	x 0.45	PKI-1M2N6	9	40	2.8	2.1	2.1	
M3	x 0.5	PKI-1M3	11	40	3.5	2.7	2.5	
M3.5	x 0.6	PKI-1M3N5	13	45	4	3	2.9	
M4	x 0.7	PKI-1M4	13	45	4.5	3.4	3.3	
M4.5	x 0.75	PKI-1M4N5	16	50	6	4.9	3.7	
M5	x 0.8	PKI-1M5	16	52	6	4.9	4.2	
M5.5	x 0.9	PKI-1M5N5	18	56	6	4.9	4.6	
M6	x 1	PKI-1M6	18	56	6	4.9	5	
M7	x 1	PKI-1M7	18	56	6	4.9	6	
M8	x 1.25	PKI-1M8	20	63	6	4.9	6.8	
M9	x 1.25	PKI-1M9	20	63	7	5.5	7.8	
M10	x 1.5	PKI-1M10	22	70	7	5.5	8.5	
M11	x 1.5	PKI-1M11	22	70	8	6.2	9.5	
M12	x 1.75	PKI-1M12	24	80	9	7	10.2	
M14	x 2	PKI-1M14	26	80	11	9	12	
M16	x 2	PKI-1M16	27	80	12	9	14	
M18	x 2.5	PKI-1M18	30	95	14	11	15.5	
M20	x 2.5	PKI-1M20	32	95	16	12	17.5	
M22	x 2.5	PKI-1M22	32	100	18	14.5	19.5	
M24	x 3	PKI-1M24	34	110	18	14.5	21	
M27	x 3	PKI-1M27	36	110	20	16	24	
M30	x 3.5	PKI-1M30	40	125	22	18	26.5	
M33	x 3.5	PKI-1M33	40	125	25	20	29.5	
M36	x 4	PKI-1M36	50	150	28	22	32	
M39	x 4	PKI-1M39	50	150	32	24	35	
M42	x 4.5	PKI-1M42	56	150	32	24	37.5	
M45	x 4.5	PKI-1M45	58	160	36	29	40.5	
M48	x 5	PKI-1M48	65	180	36	29	43	
M52	x 5	PKI-1M52	65	180	40	32	47	

## DÜZ MAKİNE KILAVUZU - DIN 371 HSS-E STRAIGHT FLUTE TAPS - DIN 371 HSS-E

► Çelik ve dökme demirin işlenmesi için uygundur.

► Suitable for tapping cast iron or similar work materials.

Delik Tipi



DIN 371



DIN 376

HSS-E

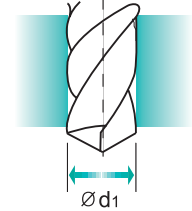
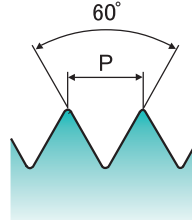
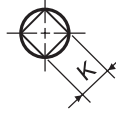
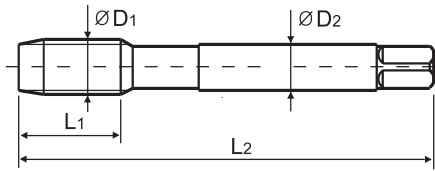
DIN  
371/376

6HX



TiN

Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	x 0.4	PKI-2M2	8	45	2.8	2.1	1.6	
M2.2	x 0.45	PKI-2M2N2	8	45	2.8	2.1	1.75	
M2.3	x 0.4	PKI-2M2N3	8	45	2.8	2.1	1.9	
M2.5	x 0.45	PKI-2M2N5	9	50	2.8	2.1	2.05	
M2.6	x 0.45	PKI-2M2N6	9	50	2.8	2.1	2.1	
M3	x 0.5	PKI-2M3	11	56	3.5	2.7	2.5	
M3.5	x 0.6	PKI-2M3N5	12	56	4	3	2.9	
M4	x 0.7	PKI-2M4	13	63	4.5	3.4	3.3	
M4.5	x 0.75	PKI-2M4N5	14	70	6	4.9	3.7	
M5	x 0.8	PKI-2M5	15	70	6	4.9	4.2	
M6	x 1	PKI-2M6	17	80	6	4.9	5	
M7	x 1	PKI-2M7	17	80	7	5.5	6	
M8	x 1.25	PKI-2M8	20	90	8	6.2	6.8	
M9	x 1.25	PKI-2M9	20	90	9	7	7.8	
M10	x 1.5	PKI-2M10	22	100	10	8	8.5	
M11	x 1.5	PKI-2M11	22	100	8	6.2	9.5	
M12	x 1.75	PKI-2M12	24	110	9	7	10.2	
M14	x 2	PKI-2M14	26	110	11	9	12	
M16	x 2	PKI-2M16	27	110	12	9	14	
M18	x 2.5	PKI-2M18	30	125	14	11	15.5	
M20	x 2.5	PKI-2M20	32	140	16	12	17.5	
M22	x 2.5	PKI-2M22	32	140	18	14.5	19.5	
M24	x 3	PKI-2M24	34	160	18	14.5	21	
M27	x 3	PKI-2M27	36	160	20	16	24	
M30	x 3.5	PKI-2M30	40	180	22	18	26.5	

© :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP

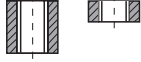
## DÜZ MAKİNE KILAVUZU DIN 371 HSS-E (Çok Amaçlı Seri)

### STRAIGHT FLUTE TAPS DIN 371 HSS-E (Multi Purpose Series)

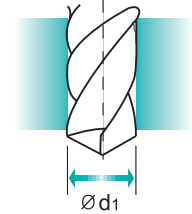
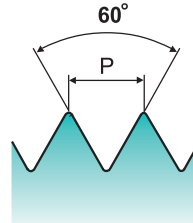
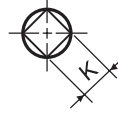
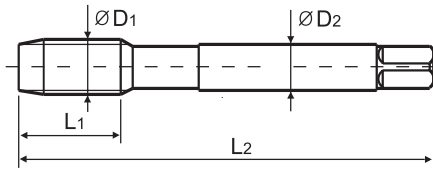
- Çelik ve dökme demirin işlenmesi için uygundur.
- İsteğe göre kaplama seçeneği

- Suitable for tapping cast iron or similar work materials.
- Coating is available on request

Delik Tipi



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	x 0.4	PKI-2M2C	8	45	2.8	2.1	1.6	
M3	x 0.5	PKI-2M3C	11	56	3.5	2.7	2.5	
M4	x 0.7	PKI-2M4C	13	63	4.5	3.4	3.3	
M5	x 0.8	PKI-2M5C	15	70	6	4.9	4.2	
M6	x 1.0	PKI-2M6C	17	80	6	4.9	5	
M8	x 1.25	PKI-2M8C	20	90	8	6.2	6.8	
M10	x 1.5	PKI-2M10C	22	100	10	8	8.5	
M12	x 1.75	PKI-2M12C	24	110	9	7	10.2	
M14	x 2.0	PKI-2M14C	26	110	11	9	12	
M16	x 2.0	PKI-2M16C	27	110	12	9	14	
M18	x 2.5	PKI-2M18C	30	125	14	11	15.5	
M20	x 2.5	PKI-2M20C	32	140	16	12	17.5	
M22	x 2.5	PKI-2M22C	32	140	18	14.5	18.5	
M24	x 3.0	PKI-2M24C	34	160	18	14.5	21	

© :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
○	○	○	○	○	○	○	○	○	○	○	○			

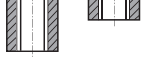


## DÜZ MAKİNE KILAVUZU DIN 371 / HSS-BM (Çok Amaçlı Seri) STRAIGHT FLUTE TAPS DIN 371 HSS-E (Multi Purpose Series)

- Özellikle paslanmaz çelik malzemelerde doğru adım profilleri, özel kılavuz geometrisi ile uzun takım ömrü.
- İsteğe göre kaplama seçeneği

- For stainless steels and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.
- Coating is available on request

Delik Tipi



M12 üstü

HSS-E

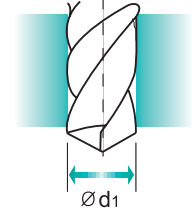
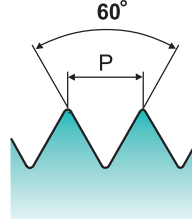
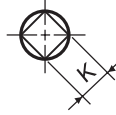
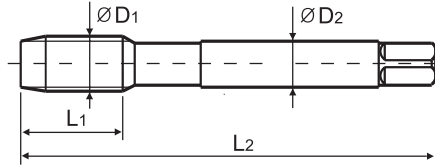
DIN 371/376

6H



Vap

Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	x 0.4	PKI-BM2M2C	8	45	2.8	2.1	1.6	
M3	x 0.5	PKI-BM2M3C	11	56	3.5	2.7	2.5	
M4	x 0.7	PKI-BM2M4C	13	63	4.5	3.4	3.3	
M5	x 0.8	PKI-BM2M5C	15	70	6	4.9	4.2	
M6	x 1.0	PKI-BM2M6C	17	80	6	4.9	5	
M8	x 1.25	PKI-BM2M8C	20	90	8	6.2	6.8	
M10	x 1.5	PKI-BM2M10C	22	100	10	8	8.5	
M12	x 1.75	PKI-BM2M12C	24	110	9	7	10.2	
M14	x 2.0	PKI-BM2M14C	26	110	11	9	12	
M16	x 2.0	PKI-BM2M16C	27	110	12	9	14	
M18	x 2.5	PKI-BM2M18C	30	125	14	11	15.5	
M20	x 2.5	PKI-BM2M20C	32	140	16	12	17.5	
M22	x 2.5	PKI-BM2M22C	32	140	18	14.5	18.5	
M24	x 3.0	PKI-BM2M24C	34	160	18	14.5	21	

© :Mükemmel ○ :iyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
	○		○			○	○							
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
				○										

## DÜZ İNCE DİŞ MAKİNE KILAVUZU - DIN 374 HSS-E (Çok Amaçlı Seri)

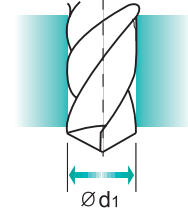
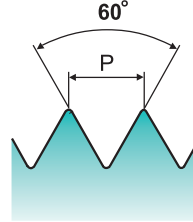
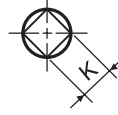
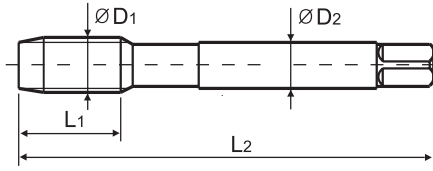
### FINE THREAD STRAIGHT FLUTE TAPS - DIN 374 HSS-E (Multi Purpose Series)

- Çelik ve dökme demirin işlenmesi için uygundur.
- İsteğe göre kaplama seçeneği

- Suitable for tapping cast iron or similar work materials.
- Coating is available on request



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M4	x 0,5	PKI-2M4CF	10	63	2,8	2,1	3,5	
M5	x 0,5	PKI-2M5CF	11	70	3,5	2,7	4,5	
M6	x 0,75	PKI-2M6N75CF	13	80	4,5	3,4	5,2	
M6	x 0,5	PKI-2M6N5CF	13	80	4,5	3,4	5,5	
M8	x 1,0	PKI-2M8CF	17	90	6	4,9	7	
M10	x 1,25	PKI-2M10N25CF	22	100	7	5,5	8,8	
M10	x 1,0	PKI-2M10CF	18	90	7	5,5	9	
M12	x 1,5	PKI-2M12N5CF	22	100	9	7	10,8	
M12	x 1,0	PKI-2M12CF	18	100	9	7	11	
M14	x 1,5	PKI-2M14N5CF	22	100	11	9	12,5	
M14	x 1,25	PKI-2M14N25CF	22	100	11	9	12,8	
M14	x 1 0	PKI-2M14CF	18	100	11	9	13	
M16	x 1,5	PKI-2M16N5CF	15	100	12	9	14,5	
M16	x 1	PKI-2M16CF	12	100	12	9	15	

© :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

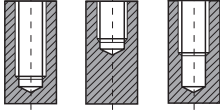
## HELİS MAKİNE KILAVUZU - DIN 371 HSS-E

### SPİRAL FLUTE TAPS - DIN 371 HSS-E

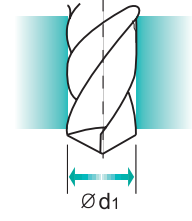
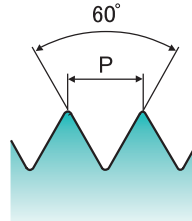
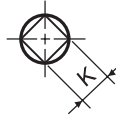
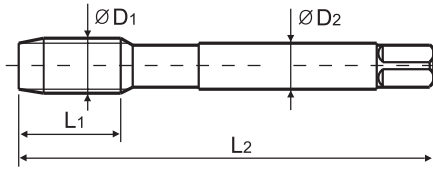
► Mükemmel talaş atımı ve özel kesme geometrisi sayesinde kör deliklerde dış açımı için uygundur.

► Suitable for tapping blind holes due to special f tube geometry and excellent chip evacuation.

Delik Tipi



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D1	P		L1	L2	D2	K	d1	
M2	x 0.4	PKI-3M2	8	45	2.8	2.1	1.6	
M2.2	x 0.45	PKI-3M2N2	8	45	2.8	2.1	1.75	
M2.3	x 0.4	PKI-3M2N3	8	45	2.8	2.1	1.9	
M2.5	x 0.45	PKI-3M2N5	9	50	2.8	2.1	2.05	
M2.6	x 0.45	PKI-3M2N6	9	50	2.8	2.1	2.1	
M3	x 0.5	PKI-3M3	6	56	3.5	2.7	2.5	
M3.5	x 0.6	PKI-3M3N5	7	56	4	3	2.9	
M4	x 0.7	PKI-3M4	7	63	4.5	3.4	3.3	
M4.5	x 0.75	PKI-3M4N5	8	70	6	4.9	3.7	
M5	x 0.8	PKI-3M5	8	70	6	4.9	4.2	
M6	x 1	PKI-3M6	10	80	6	4.9	5	
M7	x 1	PKI-3M7	10	80	7	5.5	6	
M8	x 1.25	PKI-3M8	13	90	8	6.2	6.8	
M9	x 1.25	PKI-3M9	13	90	9	7	7.8	
M10	x 1.5	PKI-3M10	15	100	10	8	8.5	
M11	x 1.5	PKI-3M11	17	100	8	6.2	9.5	
M12	x 1.75	PKI-3M12	18	110	9	7	10.2	
M14	x 2	PKI-3M14	20	110	11	9	12	
M16	x 2	PKI-3M16	20	110	12	9	14	
M18	x 2.5	PKI-3M18	25	125	14	11	15.5	
M20	x 2.5	PKI-3M20	25	140	16	12	17.5	
M22	x 2.5	PKI-3M22	25	140	18	14.5	19.5	
M24	x 3	PKI-3M24	30	160	18	14.5	21	
M27	x 3	PKI-3M27	30	160	20	16	24	
M30	x 3.5	PKI-3M30	35	180	22	18	26.5	

◎ :Mükemmel ○ :İyi

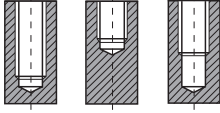
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○									○	○	○	
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
○				○		◎		○	○	○	◎	○		

## HELİS MAKİNE KILAVUZU DIN 371 HSS-E (Çok Amaçlı Seri) SPIRAL FLUTE TAPS DIN 371 HSS-E (Multi Purpose Series)

- Mükemmel talaş atımı ve özel kesme geometrisi sayesinde kör deliklerde dış açımı için uygundur.
- İsteğe göre kaplama seçeneği

- Suitable for tapping blind holes due to special f tube geometry and excellent chip evacuation.
- Coating is available on request

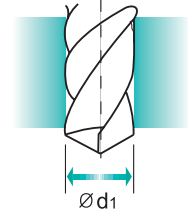
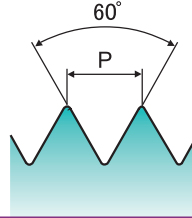
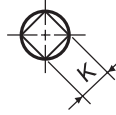
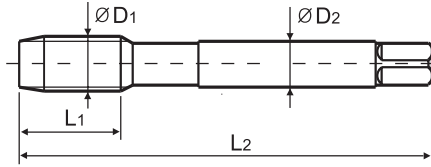
Delik Tipi



DIN 371



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	x 0,4	PKI-3M2C	8	45	2,8	2,1	1,6	
M3	x 0,5	PKI-3M3C	6	56	3,5	2,7	2,5	
M4	x 0,7	PKI-3M4C	7	63	4,5	3,4	3,3	
M4,5	x 0,75	PKI-3M4N5C	8	70	6	4,8	3,7	
M5	x 0,8	PKI-3M5C	8	70	6	4,8	4,2	
M6	x 1,0	PKI-3M6C	10	80	6	4,8	5	
M8	x 1,25	PKI-3M8C	13	80	8	6,2	6,8	
M10	x 1,5	PKI-3M10C	15	100	10	8	8,5	
M12	x 1,75	PKI-3M12C	18	110	8	7	10,2	
M14	x 2,0	PKI-3M14C	20	110	11	8	12	
M16	x 2,0	PKI-3M16C	20	110	12	8	14	
M18	x 2,5	PKI-3M18C	25	125	14	11	15,5	
M20	x 2,5	PKI-3M20C	25	140	16	12	17,5	
M22	x 2,5	PKI-3M22C	25	140	18	14,5	18,5	
M24	x 3,0	PKI-3M24C	30	160	18	14,5	21	

◎ :Mükemmel ○ :İyi

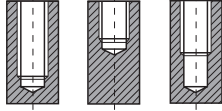
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

## HELİS MAKİNE KILAVUZU DIN 371 / HSS-BM (Çok Amaçlı Seri) SPIRAL FLUTE TAPS DIN 371 HSS-E (Multi Purpose Series)

- Özellikle paslanmaz çelik malzemelerde doğru adım profilleri, özel kılavuz geometrisi ile uzun takım ömrü.
- İsteğe göre kaplama seçeneği

- For stainless steels and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.
- Coating is available on request

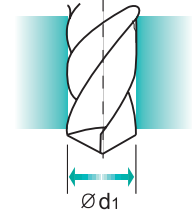
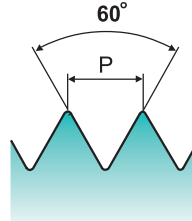
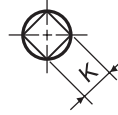
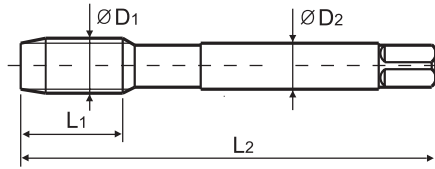
Delik Tipi



M12 üstü



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	x 0.4	PKI-BM3M2C	8	45	2.8	2.1	1.6	
M3	x 0.5	PKI-BM3M3C	6	56	3.5	2.7	2.5	
M4	x 0.7	PKI-BM3M4C	7	63	4.5	3.4	3.3	
M5	x 0.8	PKI-BM3M5C	8	70	6	4.9	4.2	
M6	x 1.0	PKI-BM3M6C	10	80	6	4.9	5	
M8	x 1.25	PKI-BM3M8C	13	90	8	6.2	6.8	
M10	x 1.5	PKI-BM3M10C	15	100	10	8	8.5	
M12	x 1.75	PKI-BM3M12C	18	110	9	7	10.2	
M14	x 2.0	PKI-BM3M14C	20	110	11	9	12	
M16	x 2.0	PKI-BM3M16C	20	110	12	9	14	
M18	x 2.5	PKI-BM3M18C	25	125	14	11	15.5	
M20	x 2.5	PKI-BM3M20C	25	140	16	12	17.5	

© :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
	○		○			○	○							
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
				○										



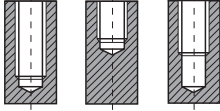
## HELİS İNCE DİŞ MAKİNE KILAVUZU DIN 374 HSS-E (Çok Amaçlı Seri)

### FINE THREAD SPIRAL FLUTE TAPS DIN 374 HSS-E (Multi Purpose Series)

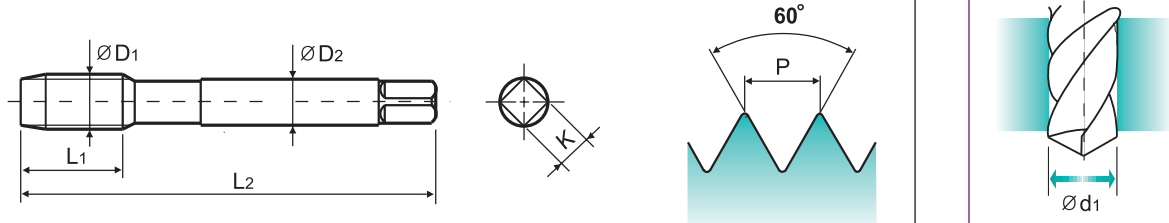
- Çelik ve dökme demirin işlenmesi için uygundur.
- İsteğe göre kaplama seçeneği

- Suitable for tapping cast iron or similar work materials.
- Coating is available on request

Delik Tipi



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M4	x 0,5	PKI-3M4CF	5	63	2,8	2,1	3,5	
M5	x 0,5	PKI-3M5CF	5	70	3,5	2,7	4,5	
M6	x 0,75	PKI-3M6N75CF	8	80	4,5	3,4	5,2	
M6	x 0,5	PKI-3M6M5CF	5	80	4,5	3,4	5,5	
M8	x 1,0	PKI-3M8CF	10	90	6	4,9	7	
M10	x 1,25	PKI-3M10N25CF	16	100	7	5,5	8,8	
M10	x 1,0	PKI-3M10CF	10	90	7	5,5	9	
M12	x 1,5	PKI-3M12N5CF	15	100	9	7	10,5	
M12	x 1,25	PKI-3M12N25CF	15	100	9	7	10,8	
M12	x 1,0	PKI-3M12CF	11	100	9	7	11	
M14	x 1,5	PKI-3M14N5CF	15	100	11	8	12,5	
M14	x 1,25	PKI-3M14N25CF	15	100	11	9	12,8	
M14	x 1,0	PKI-3M14CF	11	100	11	9	13	
M16	x 1,5	PKI-3M16N5CF	16	100	12	9	14,5	
M16	x 1,0	PKI-3M16CF	12	100	12	9	15	

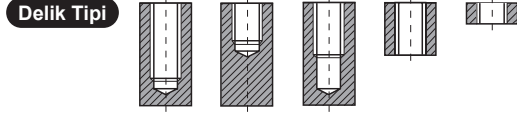
◎ :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

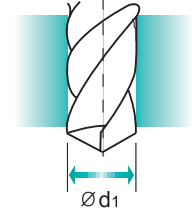
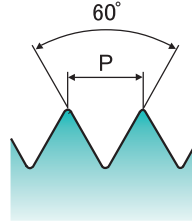
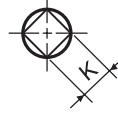
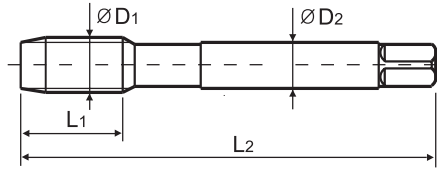
## OVALAMA KILAVUZU - YAĞ KANALLI COLD FORM TAP - OIL GROOVE

► Yumuşak malzemeler ve min %8-10 elastiklik modülüne sahip malzemelerin işlenmesi için uygundur.  
Matkap çapı normal kılavuzların çapından daha büyüktür.

► Suitable for threading soft materials with at least % 8 - 10 elongation.  
The pre-drilling holes are bigger than normal sized holes.



Yağ Kanallı  
Ovalama Kılavuzu  
Cold forming taps with  
oil grooves



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	- 0.4	PKI-4M2	8	45	2.8	2.1	1.83	
M3	- 0.5	PKI-4M3	11	56	3.5	2.7	2.8	
M4	- 0.7	PKI-4M4	13	63	4.5	3.4	3.7	
M5	- 0.8	PKI-4M5	15	70	6	4.9	4.65	
M6	- 1	PKI-4M6	17	80	6	4.9	5.55	
M8	- 1.25	PKI-4M8	20	90	8	6.2	7.4	
M10	- 1.5	PKI-4M10	22	100	10	8	9.3	
M12	- 1.75	PKI-4M12	24	110	9	7	11.2	
M14	- 2	PKI-4M14	26	110	11	9	13	
M16	- 2	PKI-4M16	27	110	12	9	15	

© :Mükemmel ○ :iyi

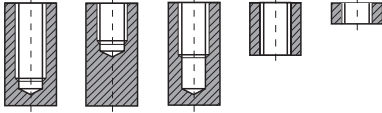
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○			○	○						○	
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
	○			○		○		○		○				

## İNCE DİŞ OVALAMA KILAVUZU - YAĞ KANALLI COLD FORM TAP - OIL GROOVE

► Çelik ve dökme demirin işlenmesi için uygundur.

► Suitable for tapping cast iron or similar work materials.

Delik Tipi



DIN 374

HSS-E

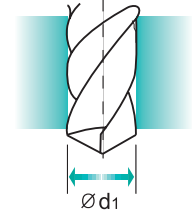
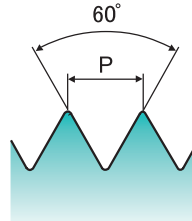
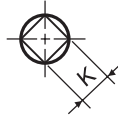
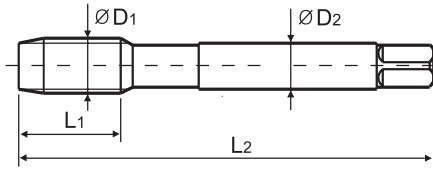
DIN  
374

6HX



NI

Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M4	x 0.5	PKI-4M4F	10	63	2.8	2.1	3.75	
M5	x 0.5	PKI-4M5F	11	70	3.5	2.7	4.75	
M6	x 0.75	PKI-4M6F	13	80	4.5	3.4	5.65	
M6	x 0.5	PKI-4M6F1	13	80	4.5	3.4	5.75	
M8	x 1	PKI-4M8F	17	90	6	4.9	7.50	
M8	x 0.75	PKI-4M8F1	14	80	6	4.9	7.65	
M10	x 1.25	PKI-4M10F	22	100	7	5.5	9.4	
M10	x 1	PKI-4M10F1	18	90	7	5.5	9.5	
M10	x 0.75	PKI-4M10F5	18	90	7	5.5	9.65	
M12	x 1.5	PKI-4M12F	22	100	9	7	11.25	
M12	x 1.25	PKI-4M12F1	22	100	9	7	11.4	
M12	x 1	PKI-4M12F5	18	100	9	7	11.5	
M14	x 1.5	PKI-4M14F	22	100	11	9	13.25	
M16	x 1.5	PKI-4M16F1	22	100	12	9	15.25	

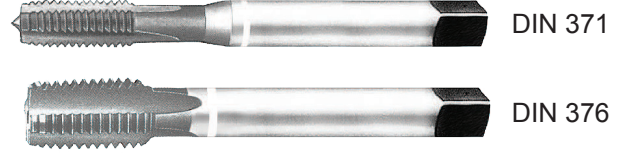
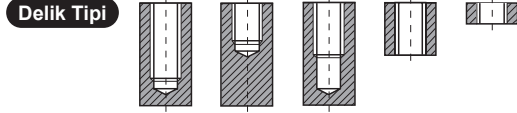
© :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

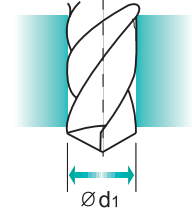
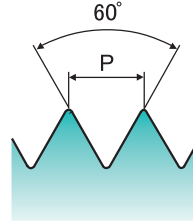
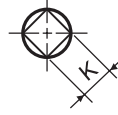
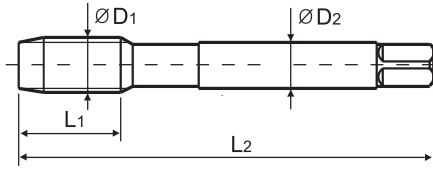
## KARBÜR DÜZ KILAVUZ CARBIDE TAP STRAIGHT

► Çelik ve dökme demirin işlenmesi için uygundur.

► Suitable for tapping cast iron or similar work materials.



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M3	x 0.5	PKI-5M3	11	56	3.5	2.7	2.5	
M4	x 0.7	PKI-5M4	13	63	4.5	3.4	3.3	
M5	x 0.8	PKI-5M5	15	70	6	4.9	4.2	
M6	x 1	PKI-5M6	17	80	6	4.9	5	
M8	x 1.25	PKI-5M8	20	90	8	6.2	6.8	
M10	x 1.5	PKI-5M10	22	100	10	8	8.5	
M12	x 1.75	PKI-5M12	24	110	9	7	10.2	
M16	x 2	PKI-5M16	27	110	12	9	14	
M20	x 2,5	PKI-5M20	32	140	16	12	17.5	

© :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
									○	○				
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
					○						○			○

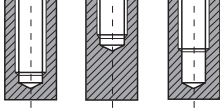
## UNC HELİS KILAVUZ (Çok Amaçlı Seri)

### UNC SPIRAL TAP (Multi Purpose Series)

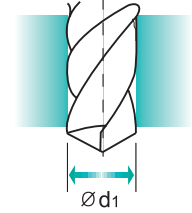
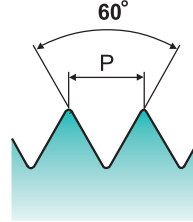
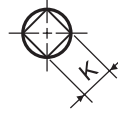
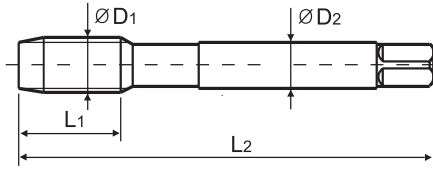
- Çok amaçlı kullanım ve doğru adım profilleri, özel kılavuz geometrisi ile uzun takım ömrü.
- İsteğe göre kaplama seçeneği

- For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.
- Coating is available on request

Delik Tipi



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
#4	- 40 UNC	PKI-73440	6	56	3.5	2.7	2.3	
#5	- 40 UNC	PKI-73540	7	56	3.5	2.7	2.6	
#6	- 32 UNC	PKI-73632	7	56	4	3	2.85	
#8	- 32 UNC	PKI-73832	8	63	4.5	3.4	3.5	
#10	- 24 UNC	PKI-731024	10	70	6	4.9	3.9	
#12	- 24 UNC	PKI-731224	10	80	6	4.9	4.5	
1/4"	- 20 UNC	PKI-731420	13	80	7	5.5	5.2	
5/16"	- 18 UNC	PKI-7351618	14	90	8	6.2	6.6	
3/8"	- 16 UNC	PKI-733816	16	100	9	7	8	
7/16"	- 14 UNC	PKI-7371614	17	100	8	6.2	9.4	
1/2"	- 13 UNC	PKI-731213	20	110	9	7	10.75	
9/16"	- 12 UNC	PKI-7391612	20	110	11	9	12.25	
5/8"	- 11 UNC	PKI-735811	22	110	12	9	13.5	
3/4"	- 10 UNC	PKI-733410	25	125	14	11	16.5	
7/8"	- 9 UNC	PKI-73789	27	140	18	14.5	19.5	
1"	- 8 UNC	PKI-7318	30	160	20	16	22.25	

◎ :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
									◎	◎				
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
					◎									◎



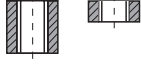
## UNC DÜZ KILAVUZ (Çok Amaçlı Seri)

### UNC STRAIGHT TAP (Multi Purpose Series)

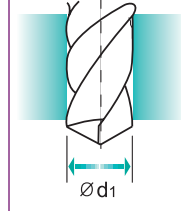
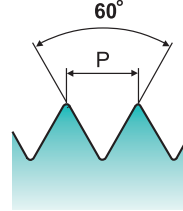
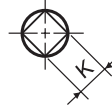
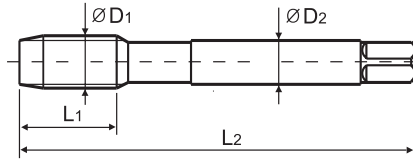
- Çok amaçlı kullanım ve doğru adım profilleri, özel kılavuz geometrisi ile uzun takım ömrü.
- İsteğe göre kaplama seçeneği

- For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.
- Coating is available on request

Delik Tipi



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
#4	- 40 UNC	PKI-72440	11	56	3.5	2.7	2.3	
#5	- 40 UNC	PKI-72540	11	56	3.5	2.7	2.6	
#6	- 32 UNC	PKI-72632	12	56	4	3	2.85	
#8	- 32 UNC	PKI-72832	13	63	4.5	3.4	3.5	
#10	- 24 UNC	PKI-721024	15	70	6	4.9	3.9	
#12	- 24 UNC	PKI-721224	16	80	6	4.9	4.5	
1/4"	- 20 UNC	PKI-721420	17	80	7	5.5	5.2	
5/16"	- 18 UNC	PKI-7251618	20	90	8	6.2	6.6	
3/8"	- 16 UNC	PKI-723816	22	100	9	7	8	
7/16"	- 14 UNC	PKI-7271614	22	100	8	6.2	9.4	
1/2"	- 13 UNC	PKI-721213	25	110	9	7	10.75	
9/16"	- 12 UNC	PKI-7291612	26	110	11	9	12.25	
5/8"	- 11 UNC	PKI-725811	27	110	12	9	13.5	
3/4"	- 10 UNC	PKI-723410	30	125	14	11	16.5	
7/8"	- 9 UNC	PKI-72789	32	140	18	14.5	19.5	
1"	- 8 UNC	PKI-7218	36	160	20	16	22.25	

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
○	○	○	○	○	○	○	○	○	○	○	○			

◎ :Mükemmel ○ :İyi

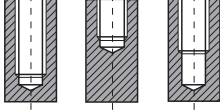
## UNF HELİS KILAVUZ (Çok Amaçlı Seri)

### UNF SPIRAL TAP (Multi Purpose Series)

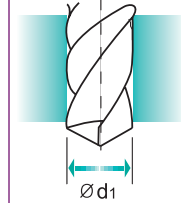
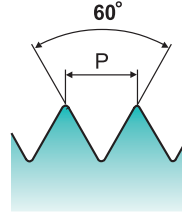
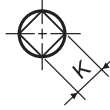
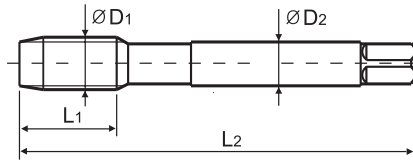
- Çelik ve dökme demirin işlenmesi için uygundur.
- İsteğe göre kaplama seçeneği

- Suitable for tapping cast iron or similar work materials.
- Coating is available on request

Delik Tipi



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
#4	- 48UNF	PKI-83448	6	56	3.5	2.7	2.4	
#5	- 44UNF	PKI-83544	7	56	3.5	2.7	2.7	
#6	- 40UNF	PKI-83640	7	56	4	3	3	
#8	- 36UNF	PKI-83836	8	63	4.5	3.4	3.5	
#10	- 32UNF	PKI-831032	10	70	6	4.9	4.1	
#12	- 28UNF	PKI-831228	10	80	6	4.9	4.7	
1/4"	- 28UNF	PKI-831428	10	80	7	5.5	5.5	
5/16"	- 24UNF	PKI-8351624	10	90	8	6.2	6.9	
3/8"	- 24UNF	PKI-833824	10	100	9	7	8.5	
7/16"	- 20UNF	PKI-8371620	13	100	8	6.2	9.9	
1/2"	- 20UNF	PKI-831220	13	100	9	7	11.5	
9/16"	- 18UNF	PKI-8391618	15	100	11	9	12.9	
5/8"	- 18UNF	PKI-835818	15	100	12	9	14.5	
3/4"	- 16UNF	PKI-833416	17	110	14	11	17.5	
7/8"	- 14UNF	PKI-837814	17	125	18	14.5	20.5	
1"	- 12UNF	PKI-83112	20	140	20	16	23.25	

◎ :Mükemmel ○ :İyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
									◎	◎				
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
					◎									◎

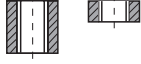
## UNF DÜZ KILAVUZ (Çok Amaçlı Seri)

### UNF STRAIGHT TAP (Multi Purpose Series)

- Çok amaçlı kullanım ve doğru adım profilleri, özel kılavuz geometrisi ile uzun takım ömrü.
- İsteğe göre kaplama seçeneği

- For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.
- Coating is available on request

Delik Tipi



HSS-E

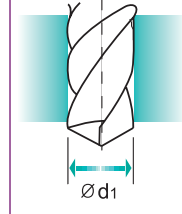
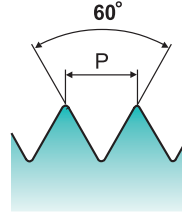
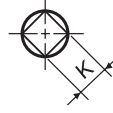
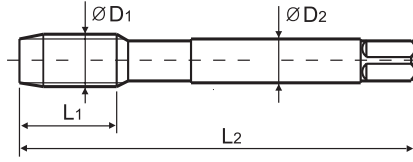
DIN  
371/374

2B



Bright  
TiN

Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
#4	- 48UNF	PKI-82448	11	56	3.5	2.7	2.4	
#5	- 44UNF	PKI-82544	11	56	3.5	2.7	2.7	
#6	- 40UNF	PKI-82640	12	56	4	3	3	
#8	- 36UNF	PKI-82836	13	63	4.5	3.4	3.5	
#10	- 32UNF	PKI-821032	15	70	6	4.9	4.1	
#12	- 28UNF	PKI-821228	16	80	6	4.9	4.7	
1/4"	- 28UNF	PKI-821428	17	80	7	5.5	5.5	
5/16"	- 24UNF	PKI-8251624	17	90	8	6.2	6.9	
3/8"	- 24UNF	PKI-823824	18	100	9	7	8.5	
7/16"	- 20UNF	PKI-8271620	22	100	8	6.2	9.9	
1/2"	- 20UNF	PKI-821220	22	100	9	7	11.5	
9/16"	- 18UNF	PKI-8291618	22	100	11	9	12.9	
5/8"	- 18UNF	PKI-825818	22	100	12	9	14.5	
3/4"	- 16UNF	PKI-823416	25	110	14	11	17.5	
7/8"	- 14UNF	PKI-827814	26	125	18	14.5	20.5	
1"	- 12UNF	PKI-82112	28	140	20	16	23.25	

◎ :Mükemmel ○ :İyi

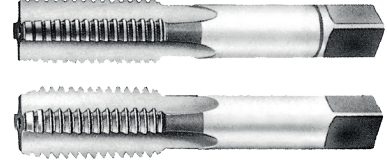
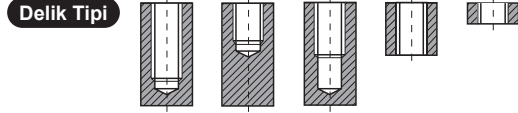
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎			

## WHITWORTH BORU DİŞ BSP EL KILAVUZU - DIN5157 / HSS

### WHITWORTH PIPE THREADS - DIN5157 / HSS

► El kılavuzu seri setlerinde İlk kılavuz ve Son kılavuz. Setin Son kılavuzu sadece delik içi final ölçüsü içindir.

► Serial hand tap set in First and Bottoming. Bottoming tap of set has final internal thread dimensions only.

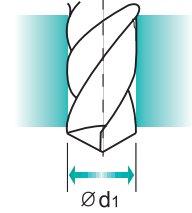
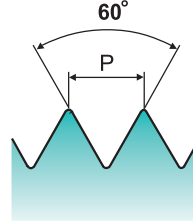
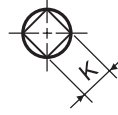
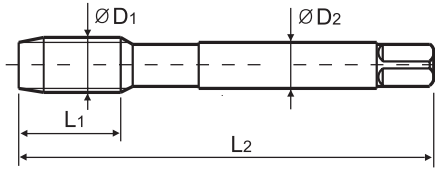


İlk

Son



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
G1/16"	- 28	PKI-6G11628	17	63	6	4.9	6.8	
G1/8"	- 28	PKI-6G1828	18	63	7	5.5	8.8	
G1/4"	- 19	PKI-6G1419	20	70	11	9	11.8	
G3/8"	- 19	PKI-6G3819	20	70	12	9	15.25	
G1/2"	- 14	PKI-6G1214	22	80	16	12	19	
G3/4"	- 14	PKI-6G3414	22	90	20	16	24.5	
G1"	- 11	PKI-6G111	25	100	25	20	30.75	
G1-1/4"	- 11	PKI-6G11411	30	125	32	24	39.5	
G1-1/2"	- 11	PKI-6G11211	30	140	36	29	45.20	

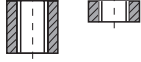
## WHITWORTH BSP BORU DIŞ DÜZ KILAVUZ DIN5156 / HSS-E

### WHITWORTH BSP PIPE TAP - DIN5156 / HSS-E

► Güçlü geometrisi sayesinde açık deliklerde diğer kılavuzlara göre çok daha hızlı kesme hızlarına çıkılabilir.

► Suitable for through hole in more cutting speed than other taps due to strong geometry.

Delik Tipi



DIN 5156

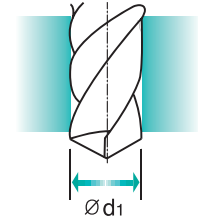
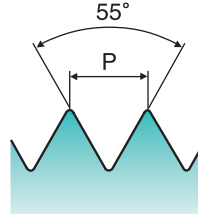
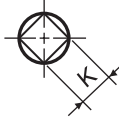
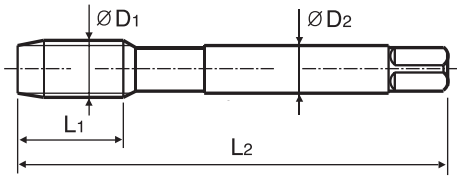
HSS-E

DIN  
5156



Parlak

Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
G1/8"	- 28	PKI-921828	20	90	7	5.5	8.8	
G1/4"	- 19	PKI-921419	22	100	11	9	11.8	
G3/8"	- 19	PKI-923819	22	100	12	9	15.25	
G1/2"	- 14	PKI-921214	25	125	16	12	19	
G3/4"	- 14	PKI-923414	28	140	20	16	24.5	
G1"	- 11	PKI-92111	30	160	25	20	30.75	

© :Mükemmel ○ :iyi

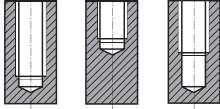
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

## WHITWORTH BSP BORU DIŞ HELİSEL KILAVUZ DIN5156 / HSS-E WHITWORTH BSP PIPE TAPS - DIN5156 / HSS-E

► Güçlü geometrisi sayesinde açık deliklerde diğer kılavuzlara göre çok daha hızlı kesme hızlarına çıkılabilir.

► Suitable for through hole in more cutting speed than other taps due to strong geometry.

Delik Tipi



DIN 5156

HSS-E

DIN  
5156

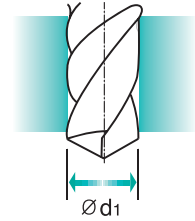
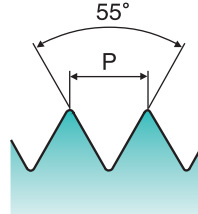
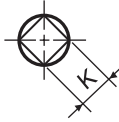
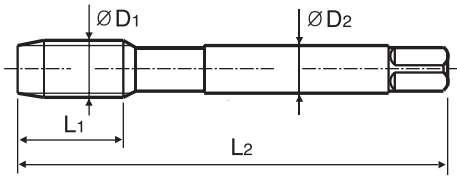
55°

C

Parlak

R40

Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
G1/8"	- 28	PKI-931828	20	90	7	5.5	8.8	
G1/4"	- 19	PKI-931419	22	100	11	9	11.8	
G3/8"	- 19	PKI-933819	22	100	12	9	15.25	
G1/2"	- 14	PKI-931214	25	125	16	12	19	
G3/4"	- 14	PKI-933414	28	140	20	16	24.5	
G1"	- 11	PKI-93111	30	160	25	20	30.75	

◎ :Mükemmel ○ :iyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○									○	○	○	○
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



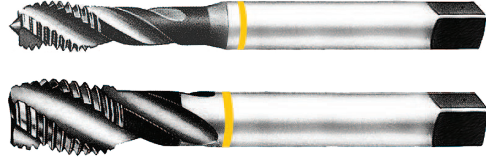
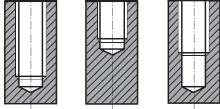
## WHITWORTH BSW HELİSEL KILAVUZ DIN2182

### WHITWORTH BSW PIPE THREADS DIN2182

► Güçlü geometrisi sayesinde açık deliklerde diğer kılavuzlara göre çok daha hızlı kesme hızlarına çıkılabilir.

► Suitable for through hole in more cutting speed than other taps due to strong geometry.

Delik Tipi

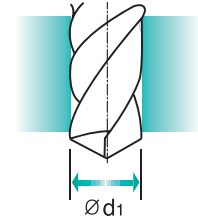
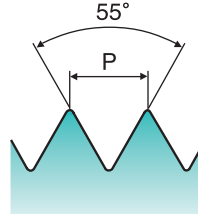
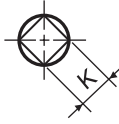
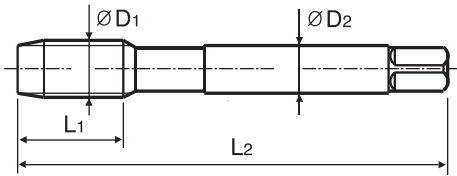


DIN 2182

DIN 2183



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
W1/8"	-	40	PKI-931840	7	56	3.5	2.7	2.5
W5/32"	-	32	PKI-9353232	7	63	4.5	3.4	3.1
W3/16"	-	24	PKI-9331624	10	70	6	4.9	3.6
W1/4"	-	20	PKI-931420	13	80	7	5.5	5.1
W5/16"	-	18	PKI-9351618	14	90	8	6.2	6.5
W3/8"	-	16	PKI-933816	16	100	9	7	7.9
W1/2"	-	12	PKI-931212	20	110	9	7	10.5
W5/8"	-	11	PKI-935811	22	110	12	9	13.5
W3/4"	-	10	PKI-933410	25	125	14	11	16.5
W7/8"	-	9	PKI-9318	27	140	18	14.5	19.25
W1"	-	8	PKI-93789	30	160	20	16	22

© :Mükemmel ○ :iyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○								○	○		
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
					○	○					○			

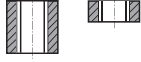
## DÜZ MAKİNE KILAVUZU DIN 371 / HSS-PM (Çok Amaçlı Seri)

### STRAIGHT FLUTE TAPS DIN 371 / HSS PM (Multi Purpose Series)

► Özellikle paslanmaz çeliklerde mükemmel diş profilleri çıkarmanızı ve özel tasarımı ile arttırılmış takım ömrü sağlar.

► For stainless steels and correct thread profiles & long tool life due to special tap geometry.

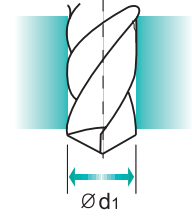
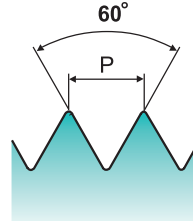
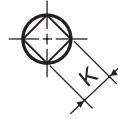
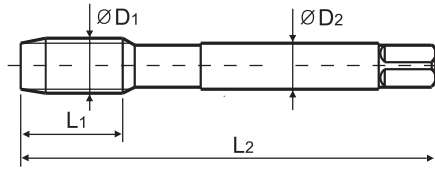
Delik Tipi



M12 ve altı M12 üstü



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	x 0.4	PKI-PM2M2C	8	45	2.8	2.1	1.6	
M3	x 0.5	PKI-PM2M3C	11	56	3.5	2.7	2.5	
M4	x 0.7	PKI-PM2M4C	13	63	4.5	3.4	3.3	
M5	x 0.8	PKI-PM2M5C	15	70	6	4.9	4.2	
M6	x 1.0	PKI-PM2M6C	17	80	6	4.9	5	
M8	x 1.25	PKI-PM2M8C	20	90	8	6.2	6.8	
M10	x 1.5	PKI-PM2M10C	22	100	10	8	8.5	
M12	x 1.75	PKI-PM2M12C	24	110	9	7	10.2	
M14	x 2.0	PKI-PM2M14C	26	110	11	9	12	
M16	x 2.0	PKI-PM2M16C	27	110	12	9	14	
M18	x 2.5	PKI-PM2M18C	30	125	14	11	15.5	
M20	x 2.5	PKI-PM2M20C	32	140	16	12	17.5	

© :Mükemmel ○ :İyi

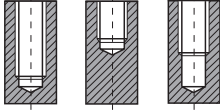
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
	○		○			○	○							
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
				○										

## HELİS MAKİNE KILAVUZU DIN 371 / HSS-PM (Çok Amaçlı Seri) SPIRAL FLUTE TAPS DIN 371 / HSS PM (Multi Purpose Series)

► Özellikle paslanmaz çeliklerde mükemmel diş profilleri çıkarmanızı ve özel tasarımı ile arttırılmış takım ömrü sağlar.

► For stainless steels and correct thread profiles & long tool life due to special tap geometry.

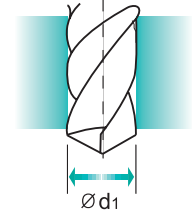
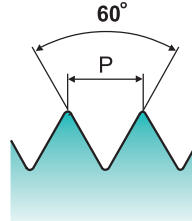
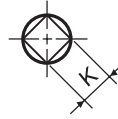
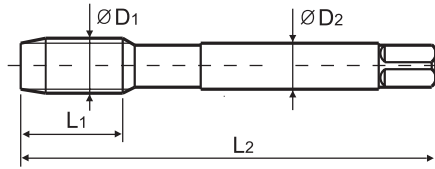
Delik Tipi



M12 ve altı M12 üstü



Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D <sub>1</sub>	P		L <sub>1</sub>	L <sub>2</sub>	D <sub>2</sub>	K	d <sub>1</sub>	
M2	x 0.4	PKI-PM3M2C	8	45	2.8	2.1	1.6	
M3	x 0.5	PKI-PM3M3C	6	56	3.5	2.7	2.5	
M4	x 0.7	PKI-PM3M4C	7	63	4.5	3.4	3.3	
M5	x 0.8	PKI-PM3M5C	8	70	6	4.9	4.2	
M6	x 1.0	PKI-PM3M6C	10	80	6	4.9	5	
M8	x 1.25	PKI-PM3M8C	13	90	8	6.2	6.8	
M10	x 1.5	PKI-PM3M10C	15	100	10	8	8.5	
M12	x 1.75	PKI-PM3M12C	18	110	9	7	10.2	
M14	x 2.0	PKI-PM3M14C	20	110	11	9	12	
M16	x 2.0	PKI-PM3M16C	20	110	12	9	14	
M18	x 2.5	PKI-PM3M18C	25	125	14	11	15.5	
M20	x 2.5	PKI-PM3M20C	25	140	16	12	17.5	

© :Mükemmel ○ :iyi

Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
	○		○			○	○							
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	Cu < 350	Cu Alloy Short	Cu Alloy Long	Cu-Al-Fe < 1500	Al / Mg < 350	Al Wrought	Al Si ≤ 10%	Al Si > 10%	Plastic Thermosoft	Plastic Thermoset	Plastic FRP
				○										



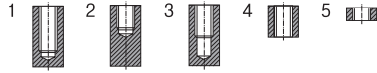
## MAKİNA KILAVUZLARI

### ÖNERİ TABLOSU

### KULLANABİLİRLİK

⊙ = MÜKEMMEL

○ = İYİ



#### MALZEME GRUPLARI

MU

MU

MU

MU

DIN	Malzeme Grubu	Ürün Kodu	MU	MU	MU	MU
DIN 371/376	M	Ürün Kodu	PKI-3MC	PKI-BM3M		
DIN 371/376	EG-M	Ürün Kodu				
DIN 352	M	Ürün Kodu				
DIN 374	MF	Ürün Kodu			PKI-3MCF	
DIN 371/376	UNC	Ürün Kodu				PKI-73
DIN 371/376	EG-UNC	Ürün Kodu				
DIN 371/374	UNF	Ürün Kodu				
DIN 371/376	EG-UNF	Ürün Kodu				
DIN 2182/2183	BSW	Ürün Kodu				
DIN 357/5156	M/G(BSP)	Ürün Kodu				
LONG	M	Ürün Kodu				
YÜZEY İŞLEMİ / KAPLAMA			Bright	Buna/Menuşli	Bright	Bright
HELİS AÇISI			R40	R40	R40	R40
GİRİŞ AÇISI			C	C	C	C
DELİK TİPİ			1-2-3	1-2-3	1-2-3	1-2-3

### SOĞUTMA

A = Kesme Yağı  
T = Bor Yağı  
X = Kesme Yağı / Bor Yağı  
S = Kuru Çalışma (Hava ile)  
Z = Kuru Çalışma / Bor Yağı

SERTLİK

KOPMA MUKAVEMETİ

TALAŞ TİPİ

KESME HIZI

SOĞUTMA TİPİ



#### MALZEME GRUPLARI




















#### MALZEME GRUPLARI

HB

Rm  
N/mm2

Vc  
m/min

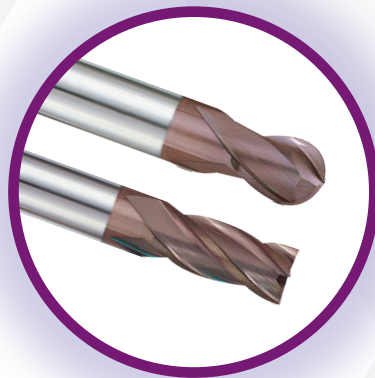
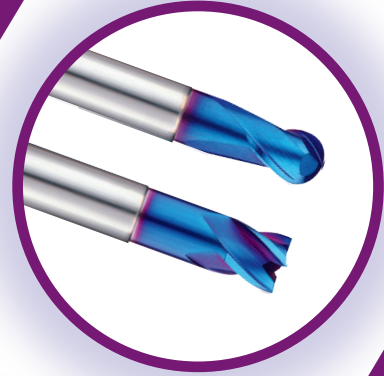
Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	Malzeme Grubu	
10. ÇELİK	11	Steel < 400	Manyetik Yumuşak çelikler	< 120	< 400	Çok Uzun	15-20	T	⊙	⊙	⊙	⊙
	12	Steel < 700	Yapı Çelikleri	< 200	< 700	Orta/Uzun	15-20	T	⊙	⊙	⊙	⊙
	13	Steel < 850	Karbon Çelikleri	< 250	< 850	Uzun	12-18	T	⊙	⊙	⊙	⊙
	14	St. Alloy < 850	Alaşımli Çelikler	< 250	< 850	Uzun	10-15	X	⊙	⊙	⊙	⊙
	15	St. Alloy < 1,200	Alaşımli Çelikler, Sertleştirilmiş Çelikler	< 350	≤ 1,200	Uzun	6-10	X	⊙	⊙	⊙	⊙
	16	St. Alloy > 1,200	Alaşımli Çelikler, Sertleştirilmiş Çelikler	> 350	> 1,200	Uzun	3-5	A	⊙	⊙	⊙	⊙
20. PASLANMAZ ÇELİK	21	INOX Free < 850	Kolay İşlenebilir Paslanmaz Çelikler	< 250	< 850	Orta	7-10	A	⊙	⊙	⊙	⊙
	22	INOX Aust. < 850	Ostenetik Paslanmaz Çelikler	< 250	< 850	Uzun	5-8	A	⊙	⊙	⊙	⊙
	23	INOX < 1,100	Fer., F.+Ost., Martenzetik Pas. Çel.	< 300	< 1,100	Uzun	4-6	A	⊙	⊙	⊙	⊙
30. DÖKMEDEMİR	31	GG Cast < 500	Gri Dökme Demir (Pik Döküm)	< 150	< 500	Çok Kısa	10-15	X	⊙	⊙	⊙	⊙
	32	GG Cast < 1,000	Gri Dökme Demir (Pik Döküm)	< 300	< 1,000	Çok Kısa	5-8	T	⊙	⊙	⊙	⊙
	33	GGG Cast < 700	Sfero Döküm	< 200	< 700	Kısa	10-15	X	⊙	⊙	⊙	⊙
	34	GGG Cast < 1,000	Sfero Döküm	< 300	< 1,000	Kısa	5-8	X	⊙	⊙	⊙	⊙
40. TİTANYUM	41	Ti < 700	Alaşımli Titanyum	< 200	< 700	Çok Uzun	10-15	T	⊙	⊙	⊙	⊙
	42	Ti Alloy < 900	Alaşımli Titanyum	< 270	< 900	Orta/Kısa	8-12	A	○	○	○	○
	43	Ti Alloy ≤ 1,300	Alaşımli Titanyum	< 350	≤ 1,300	Orta/Kısa	4-6	A	○	○	○	○
50. NİKEL	51	Ni < 500	Alaşımli Nikel	< 150	< 500	Çok Uzun	8-12	A	⊙	⊙	⊙	⊙
	52	Ni Alloy < 900	Alaşımli Nikel	< 270	< 900	Uzun	10-15	A	○	○	○	○
	53	Ni Alloy ≤ 1,400	Alaşımli Nikel	< 410	≤ 1,400	Uzun	2-4	A	○	○	○	○
60. BAKIR, PİRİNÇ, BRONZ	61	Cu < 350	Alaşımli Bakır	< 100	< 350	Çok Uzun	8-12	T	⊙	⊙	⊙	⊙
	62	Cu Alloy (Short)	Kısa Talaş veren Pirinç, Bronz, Bakır	< 200	< 700	Orta/Kısa	25-35	T	⊙	⊙	⊙	⊙
	63	Cu Alloy (Long)	Uzun Talaş veren Pirinç, Bronz, Bakır	< 200	< 700	Uzun	15-20	T	⊙	⊙	⊙	⊙
	64	Cu-Al-Fe < 1,500	Bakır, Alüminyum, Demir Alaşımları	< 470	< 1,500	Kısa	3-5	A				
70. ALÜMİNYUM	71	Al/Mg < 350	Alaşımli Alüminyum, Magnezyum	< 100	< 350	Çok Uzun	10-15	T				
	72	Al Wrought	Alaşımli Alüminyum	< 150	< 500	Orta	25-35	T	⊙	⊙	⊙	⊙
	73	Al (Si ≤ 10%)	Alaşımli Alüminyum (Düşük Silisyumlu)	< 120	< 400	Orta/Kısa	15-20	T	⊙	⊙	⊙	⊙
	74	Al (Si > 10%)	Alaşımli Alüminyum (Yüksek Silisyumlu)	< 120	< 400	Kısa	10-15	T	⊙	⊙	⊙	⊙
80. PLASTİK	81	Thermosoft.	Termoplastikler			Çok Uzun	20-30	T				
	82	Thermoset.	Termoset Plastikler			Kısa	8-12	Z				
	83	FRP	Fiberle Güçlendirilmiş Plastikler			Çok Kısa	5-7	Z				

MU	MU	MU	MU	MU	MU	VA	VA	VA	VA	GS	GS	GS	GS	GV	GV	GG	GG	
	PKI-2MC	PKI-BM2M				PKI-PM3M	PKI-PM3M	PKI-PM3M	PKI-PM3M					PKI-3M	PKI-4M		PKI-2M	PKI-5M
				PKI-2MCF													PKI-4MF	
					PKI-72													
PKI-83						PKI-82												
												PKI-93						
											PKI-92		PKI-93					
Bright	Bright	<i>Buna Menesiz</i>	Bright	Bright	Bright	Vap	Vap	Vap	Vap	Bright	Bright	Bright	TiN	NI	NI	TiN	Bright	
R40						R45	R45					R40	R40	R40				
C	B	B	B	B	B	C	C	B	B	B	C	C	C	C	C	C	C	C
1-2-3	4-5	4-5	4-5	4-5	4-5	1-2-3	1-2-3	4-5	4-5	4-5	1-2-3	1-2-3	1-2-3	1-2-3 4-5	1-2-3 4-5	1-2-3 4-5	1-2-3 4-5	
																		
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**PRO-X**



**3**

# PARMAK FREZELER *END MILLS*

**PRO-X****PARMAK FREZELER  
END MILLS****4 AĞIZLI KISA KAPLAMALI KARBÜR PARMAC FREZE  
4 FLUTE SHORT LENGTH CARBIDE END MILL**

- Yüksek sıcaklıklarda kuru işlemler için uygundur.
- Mükemmel, yüksek performanslı parmak frezedir.
- 4 ağızlı parmak freze daha iyi yüzey kalitesi verir.

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.



Ölçü : mm

KOD	Freze Çapı	Şaft Çapı	Kesme Kenarı Boyu	Tam Boy	
PPF-14010	1.0	3	3	39	
PPF-14015	1.5	3	5	39	
PPF-14020	2.0	3	7	39	
PPF-14025	2.5	3	7	39	
PPF-14030	3.0	3	10	39	
PPF-14040	4.0	4	14	51	
PPF-14050	5.0	5	16	51	
PPF-14060	6.0	6	19	64	
PPF-14070	7.0	7	16	60	
PPF-14080	8.0	8	21	64	
PPF-14090	9.0	9	19	67	
PPF-14100	10.0	10	22	70	
PPF-14110	11.0	11	26	83	
PPF-14120	12.0	12	25	76	
PPF-14130	13.0	13	26	83	
PPF-14140	14.0	14	26	83	
PPF-14160	16.0	16	32	89	
PPF-14200	20.0	20	38	102	

Freze Çapı Tolerans(mm)	Şaft Çapı Tolerans
0~-0.03	h6

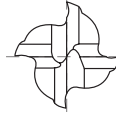
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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
©	©	©				○		○	○	○	○	○		

**PRO-X****PARMAK FREZELER  
END MILLS****4 AĞIZLI EXTRA UZUN KAPLAMALI KARBÜR PARMAC FREZE  
4 FLUTE EXTRA LONG TYPE CARBIDE END MILL**

- Yüksek sıcaklıklarda kuru işlemler için uygundur.
- Mükemmel, yüksek performanslı parmak frezedir.
- 4 ağızlı parmak freze daha iyi yüzey kalitesi verir.

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.



Ölçü : mm

KOD	Freze Çapı	Şaft Çapı	Kesme Kenarı Boyu	Tam Boy	
PPF-14030-EX	3.0	3	20	60	
PPF-14040-EX	4.0	4	20	60	
PPF-14050-EX	5.0	5	25	75	
PPF-14060-EX	6.0	6	30	75	
PPF-14080-EX	8.0	8	30	75	
PPF-14100-EX	10.0	10	40	100	
PPF-14120-EX	12.0	12	45	100	
PPF-14140-EX	14.0	14	45	100	
PPF-14160-EX	16.0	16	45	100	
PPF-14200-EX	20.0	20	45	100	

Freze Çapı Tolerans(mm)	Şaft Çapı Tolerans
0~-0.03	h6

© :Mükemmel ○ :iyi

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels	High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRc30~40	HRc40~45 HRc45~55	HRc55~70									
©	©	©			○		○	○	○	○	○		

## 4 AĞIZLI KISA KAPLAMALI KÖŞE RADÜSLÜ KARBÜR PARMAC FREZE 4 FLUTE CORNER RADIUS CARBIDE END MILL

- Yüksek sıcaklıklarda kuru işlemler için uygundur.
- Mükemmel, yüksek performanslı parmak frezedir.
- 4 ağızlı parmac freze daha iyi yüzey kalitesi verir.

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.



Ölçü : mm

KOD	Corner Radius R	Freze Çapı	Şaft Çapı	Kesme Kenarı Boyu	Tam Boy	
PPF-14020-02R	R0.2	2,0	4	4	50	
PPF-14020-03R	R0.3	2,0	4	4	50	
PPF-14020-05R	R0.5	2,0	4	4	50	
PPF-14025-02R	R0.2	2,5	4	5	50	
PPF-14030-02R	R0.2	3,0	4	6	50	
PPF-14030-03R	R0.3	3,0	4	6	50	
PPF-14030-05R	R0.5	3,0	4	6	50	
PPF-14030-1R	R1.0	4,0	4	8	50	
PPF-14040-02R	R0.2	4,0	4	8	50	
PPF-14040-03R	R0.3	4,0	4	8	50	
PPF-14040-05R	R0.5	4,0	4	8	50	
PPF-14040-1R	R1.0	5,0	6	10	50	
PPF-14050-02R	R0.2	5,0	6	10	50	
PPF-14050-03R	R0.3	5,0	6	10	50	
PPF-14050-05R	R0.5	5,0	6	10	50	
PPF-14050-1R	R1.0	6,0	6	12	50	
PPF-14060-02R	R0.2	6,0	6	12	50	
PPF-14060-03R	R0.3	6,0	6	12	50	
PPF-14060-05R	R0.5	6,0	6	12	50	
PPF-14060-1R	R1.0	8,0	8	16	60	
PPF-14080-05R	R0.5	8,0	8	16	60	
PPF-14080-1R	R1.0	8,0	10	20	75	
PPF-14100-05R	R0.5	10,0	10	20	75	
PPF-14100-1R	R1.0	10,0	10	20	75	
PPF-14120-05R	R0.5	12,0	12	24	75	
PPF-14120-1R	R1.0	12,0	12	24	75	

◎ :Mükemmel ○ :iyi

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎				○		○	○	○	○	○		

**PRO-X****PARMAK FREZELER  
END MILLS****4 AĞIZLI UZUN KAPLAMALI KÖŞE RADÜSLÜ KARBÜR PARMAC FREZE  
4 FLUTE LONG TYPE CORNER RADIUS CARBIDE END MILL**

- Yüksek sıcaklıklarda kuru işlemler için uygundur.
- Mükemmel, yüksek performanslı parmak frezedir.
- 4 ağızlı parmak freze daha iyi yüzey kalitesi verir.

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.



Ölçü : mm

KOD	Corner Radius R	Freze Çapı	Şaft Çapı	Kesme Kenarı Boyu	Tam Boy	
PPF-14030-05RL	R0.5	3.0	4	6	75	
PPF-14030-1RL	R1.0	3.0	4	6	75	
PPF-14040-05RL	R0.5	4.0	4	8	75	
PPF-14040-1RL	R1.0	4.0	4	8	75	
PPF-14050-05RL	R0.5	5.0	6	10	75	
PPF-14050-1RL	R1.0	5.0	6	10	75	
PPF-14060-05RL	R0.5	6.0	6	12	75	
PPF-14060-1RL	R1.0	6.0	6	12	75	
PPF-14080-05RL	R0.5	8.0	8	16	100	
PPF-14080-1RL	R1.0	8.0	8	16	100	
PPF-14100-05RL	R0.5	10.0	12	24	100	
PPF-14100-1RL	R1.0	10.0	12	24	100	
PPF-14120-05RL	R1.5	12.0	12	24	100	
PPF-14120-1RL	R2.0	12.0	12	24	100	

PARMAK FREZELER  
END MILLS  
3

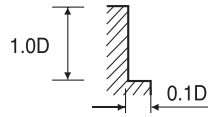
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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70									
©	©	©				○		○	○	○	○	○		

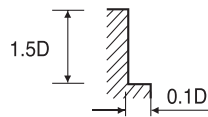
**TAVSİYE EDİLEN KESME DEĞERLERİ**  
**RECOMMENDED CUTTING CONDITIONS**

**PPF - 14 SERİSİ**

MALZEME	ALAŞIMSIZ ÇELİKLER ALAŞIMLI ÇELİKLER TAKIM ÇELİKLERİ				ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				PASLANMAZ ÇELİKLER			
SERTLİK	~ HRc 30				HRc 30 ~ HRc 45							
GÜÇ	~1000N/mm <sup>2</sup>				1000~1500N/mm <sup>2</sup>							
ÇAP	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
1.0	17600	150	55	0.002	10250	85	30	0.002	8650	75	25	0.002
1.5	11800	215	55	0.005	7050	115	35	0.004	7050	120	35	0.004
2.0	9850	240	60	0.006	6450	145	40	0.006	5350	120	35	0.006
3.0	7600	270	70	0.009	4750	170	45	0.009	3950	145	35	0.009
4.0	6450	485	80	0.019	3950	300	50	0.019	3300	240	40	0.018
5.0	5350	510	85	0.024	3200	305	50	0.024	2700	255	40	0.024
6.0	4750	560	90	0.029	2850	350	55	0.031	2400	280	45	0.029
8.0	3550	605	90	0.043	2150	325	55	0.038	1800	300	45	0.042
10.0	2750	520	85	0.047	1700	255	55	0.038	1450	255	45	0.044
12.0	2350	440	90	0.047	1450	215	55	0.037	1150	205	45	0.045
14.0	2100	395	90	0.047	1300	195	55	0.038	1050	190	45	0.045
16.0	1850	350	95	0.047	1150	170	60	0.037	950	170	50	0.045
20.0	1450	270	90	0.047	900	135	55	0.038	700	130	45	0.046



MALZEME	DÖKME DEMİR				ALÜMİNYUMLU ALAŞIMLAR				BAKIR, PİRİNÇ DEMİR DİŞİ METALLER			
SERTLİK					HRc 30 ~ HRc 45							
GÜÇ					1000~1500N/mm <sup>2</sup>							
ÇAP	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
1.0	18700	620	60	0.008	44000	1050	140	0.006	24700	605	80	0.006
1.5	12100	620	55	0.013	27500	1160	130	0.011	20300	910	95	0.011
2.0	9350	640	60	0.017	22000	1320	140	0.015	16500	1035	105	0.016
3.0	6050	640	55	0.026	15400	1320	145	0.021	11000	1035	105	0.024
4.0	4600	640	60	0.035	11000	1320	140	0.030	8800	1035	110	0.029
5.0	3650	640	55	0.044	9150	1320	145	0.036	6800	1035	105	0.038
6.0	2950	770	55	0.065	7600	1430	145	0.047	5700	1100	105	0.048
8.0	2200	815	55	0.093	5700	1430	145	0.063	4400	1100	110	0.063
10.0	1850	860	60	0.116	4600	1430	145	0.078	3400	1100	105	0.081
12.0	1450	900	55	0.155	3750	1430	140	0.095	2850	1100	105	0.096
14.0	1300	945	55	0.182	3300	1430	145	0.108	2400	1100	105	0.115
16.0	1100	970	55	0.220	2850	1430	145	0.125	2200	1100	110	0.125
20.0	900	1035	55	0.288	2200	1430	140	0.163	1700	1100	105	0.162



\* İlerleme L & EX kodlu uzun frezelerde %50 oranında azaltılmalıdır.

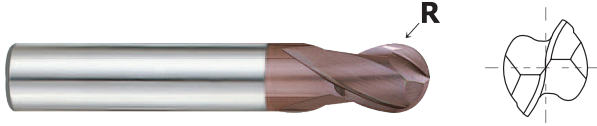
DEVİR = dev/dak  
İLERLEME = mm/dak  
Vc = m/dak  
fz = mm/ağız



## 2 AĞIZLI KÜRESEL KARBÜR PARMAC FREZE 2 FLUTE BALL NOSE CARBIDE END MILL

- Yüksek sıcaklıklarda kuru işlemler için uygundur.
- Mükemmel, yüksek performanslı parmak frezedir.
- Profil ve kontör işleme için dizayn edilmiştir.

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours



Ölçü : mm

KOD	Corner Radius R (±0.02)	Freze Çapı	Şaft Çapı	Kesme Kenarı Boyu	Tam Boy	
PPF-22010	R 0.5	1.0	3	3	39	
PPF-22015	R 0.75	1.5	3	5	39	
PPF-22020	R 1.0	2.0	3	7	39	
PPF-22025	R 1.25	2.5	3	8	39	
PPF-22030	R 1.5	3.0	3	9	39	
PPF-22040	R 2.0	4.0	4	14	51	
PPF-22050	R 2.5	5.0	5	16	51	
PPF-22060	R 3.0	6.0	6	19	64	
PPF-22080	R 4.0	8.0	8	21	64	
PPF-22100	R 5.0	10.0	10	22	70	
PPF-22110	R 5.5	11.0	11	25	70	
PPF-22120	R 6.0	12.0	12	25	76	
PPF-22160	R 8.0	16.0	16	32	89	
PPF-22200	R 10.0	20.0	20	38	102	

Freze Çapı Tolerans(mm)	Şaft Çapı Tolerans
0~-0.03	h6

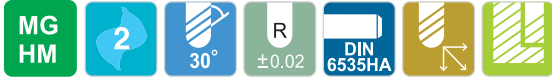
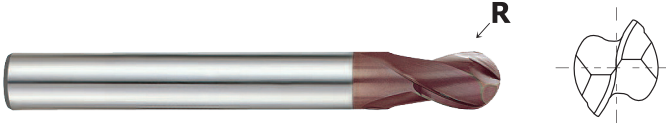
◎ :Mükemmel ○ :iyi

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			○		○	○	○	○	○		

## 2 AĞIZLI UZUN KÜRESEL KARBÜR PARMAC FREZE 2 FLUTE TYPE BALL NOSE CARBIDE END MILL

- Yüksek sıcaklıklarda kuru işlemler için uygundur.
- Mükemmel, yüksek performanslı parmak frezedir.
- Profil ve kontör işleme için dizayn edilmiştir.

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours



Ölçü : mm

KOD	Corner Radius R (±0.02)	Freze Çapı	Şaft Çapı	Kesme Kenarı Boyu	Tam Boy	
PPF-22030-L	R 1.5	3.0	3	5	75	
PPF-22040-L	R 2.0	4.0	4	8	75	
PPF-22050-L	R 2.5	5.0	5	9	75	
PPF-22060-L	R 3.0	6.0	6	10	100	
PPF-22080-L	R 4.0	8.0	8	12	100	
PPF-22100-L	R 5.0	10.0	10	14	100	
PPF-22120-L	R 6.0	12.0	12	16	100	
PPF-22140-L	R 7.0	14.0	14	18	100	
PPF-22160-L	R 8.0	16.0	16	22	150	

Freze Çapı Tolerans(mm)	Şaft Çapı Tolerans
0~-0.03	h6

◎ :Mükemmel ○ :iyi

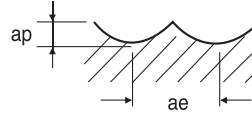
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			○		○	○	○	○	○		

**TAVSİYE EDİLEN KESME DEĞERLERİ**  
**RECOMMENDED CUTTING CONDITIONS**

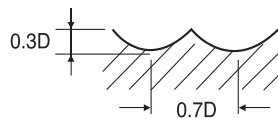
**PPF - 22 SERİSİ**

MALZEME			ALAŞIMSIZ ÇELİKLER ALAŞIMLI ÇELİKLER TAKIM ÇELİKLERİ				ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				PASLANMAZ ÇELİKLER			
SERTLİK			~ HRc 30				HRc 30 ~ HRc 45				HRc 45 ~ HRc 50			
GÜÇ			~1000N/mm <sup>2</sup>				1000~1500N/mm <sup>2</sup>				1500N/mm <sup>2</sup> ~			
ÇAP			Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
R1.0	x	2.0	12350	640	80	0.026	9150	415	55	0.023	4000	125	25	0.016
R1.5	x	3.0	11400	575	105	0.025	8550	390	80	0.023	3800	125	35	0.016
R2.0	x	4.0	8950	630	110	0.035	7150	450	90	0.031	3600	150	45	0.021
R2.5	x	5.0	7800	700	125	0.045	6200	490	95	0.040	3100	150	50	0.024
R3.0	x	6.0	7250	870	135	0.060	5900	705	110	0.060	2700	160	50	0.030
R4.0	x	8.0	6100	1090	155	0.089	4900	785	125	0.080	2050	190	50	0.046
R5.0	x	10.0	5450	1330	170	0.122	4350	870	135	0.100	1750	190	55	0.054
R6.0	x	12.0	4990	1500	190	0.150	3950	950	150	0.120	1500	210	55	0.070
R7.0	x	14.0	4530	1495	200	0.165	3600	925	160	0.128	1300	210	55	0.081
R8.0	x	16.0	4085	1470	205	0.180	3200	905	160	0.141	1150	210	60	0.091
R9.0	x	18.0	3800	1425	215	0.188	3000	890	170	0.148	1050	210	60	0.100
R10.0	x	20.0	3550	1425	225	0.201	2800	885	175	0.158	950	210	60	0.111

ap : D1~D6=0.2mm  
D8~D20=0.3mm  
ae : 0.2D



MALZEME			DÖKME DEMİR				ALUMİNYUMLU ALAŞIMLAR			
SERTLİK										
GÜÇ										
ÇAP			Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
R1.0	x	2.0	10500	220	65	0.010	30800	395	195	0.006
R1.5	x	3.0	7050	230	65	0.016	20500	395	195	0.010
R2.0	x	4.0	5150	285	65	0.028	15400	395	195	0.013
R2.5	x	5.0	4150	330	65	0.040	12100	470	190	0.019
R3.0	x	6.0	3400	360	65	0.053	10300	470	195	0.023
R4.0	x	8.0	2500	460	65	0.092	7900	540	200	0.034
R5.0	x	10.0	2050	460	65	0.112	6150	540	195	0.044
R6.0	x	12.0	1750	460	65	0.131	5150	630	195	0.061
R7.0	x	14.0	1400	460	60	0.164	4300	630	190	0.073
R8.0	x	16.0	1300	460	65	0.177	3850	540	195	0.070
R9.0	x	18.0	1100	460	60	0.209	3400	540	190	0.079
R10.0	x	20.0	1050	420	65	0.200	2950	540	185	0.092



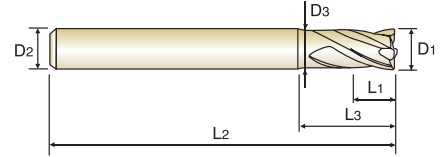
\* İlerleme L & EX kodlu uzun frezelerde %50 oranında azaltılmalıdır.

DEVİR = dev/dak  
İLERLEME = mm/dak  
Vc = m/dak  
fz = mm/ağz

## 4 AĞIZLI KAPLAMALI KARBÜR PARMAC FREZE (50-70 HRC) 4 FLUTE CARBIDE END MILL (50-70 HRC)

- Yüksek sertlikteki malzemelerin işlenmesi için tasarlanmıştır
- Yeni geliştirilmiş ham madde ve kaplama yapısı ile yüksek hızlarda ve kuru kesimde çalışmaya uygundur
- Mükemmel son kesim
- Yüksek hassasiyetli frezeleme operasyonları için uygunluk
- Yüksek aşınma direnci

- Designed to machine high hardened materials
- Suitable for dry cutting, high speed cutting thanks to newly developed raw material and new coating
- Excellent workpiece finish
- Designed for high precision milling operation
- High wear resistance



Ölçü : mm

KOD	Freze Çapı D <sub>1</sub>	Şaft Çapı D <sub>2</sub>	Kesme Kenarı Boyu L <sub>1</sub>	Arka Boyun Çapı L <sub>3</sub>	Tam Boy L <sub>2</sub>	Boyun Çapı D <sub>3</sub>	
PPF-414010	1.0	6	1.5	3	50	0.95	
PPF-414020	2.0	6	2	5	50	1.95	
PPF-414030	3.0	6	3	8	55	2.85	
PPF-414040	4.0	6	4	10	55	3.85	
PPF-414050	5.0	6	5	13	55	4.85	
PPF-414060	6.0	6	6	15	55	5.85	
PPF-414080	8.0	8	8	20	65	7.7	
PPF-414100	10.0	10	10	25	75	9.7	
PPF-414120	12.0	12	12	28	85	11.7	
PPF-414140							
PPF-414160	16.0	16	16	32	90	15.7	
PPF-414200	20.0	20	20	40	105	19.7	

Boy	Freze Çapı Toleransı (mm)	Boyun Çapı Toleransı
Ø6'a kadar	0~-0.012	h6
Ø6 sonrası	0~-0.015	

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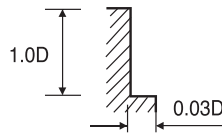
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels	High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRc30~40	HRc40~45 HRc45~55	HRc55~70									
		○	○	◎	◎								

**TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS**

**PPF- 414 SERİSİ**

MALZEME	ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				SERTLEŞTİRİLMİŞ ÇELİKLER							
	HRc 30 ~ HRc 40				HRc 40 ~ HRc 50				HRc 50 ~ HRc 55			
SERTLİK	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
1.0	48000	1480	150	0.008	38000	1050	120	0.007	25500	710	80	0.007
2.0	33300	1750	210	0.013	26000	1250	165	0.012	17500	840	110	0.012
3.0	21800	1750	205	0.020	17300	1250	165	0.018	11500	840	110	0.018
4.0	16700	1800	210	0.027	13200	1300	165	0.025	8800	880	110	0.025
5.0	15700	2000	245	0.032	12500	1500	195	0.030	8300	1000	130	0.030
6.0	13100	1950	245	0.037	10350	1400	195	0.034	6900	950	130	0.034
8.0	9880	1880	250	0.048	7800	1350	195	0.043	5200	900	130	0.043
10.0	7800	1750	245	0.056	6150	1260	195	0.051	4100	840	130	0.051
12.0	6650	1750	250	0.066	5250	1260	200	0.060	3500	840	130	0.060
16.0	4900	1500	245	0.077	3900	1100	195	0.071	2600	730	130	0.070
20.0	3900	1300	245	0.083	3100	970	195	0.078	2050	650	130	0.079

MALZEME	SERTLEŞTİRİLMİŞ ÇELİKLER											
	HRc 55 ~ HRc 60				HRc 60 ~ HRc 65				HRc 65 ~ HRc 70			
SERTLİK	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
1.0	20500	430	65	0.005	16000	270	50	0.004	12500	175	40	0.875
2.0	14500	520	90	0.009	11000	320	70	0.007	9500	230	60	0.821
3.0	9500	520	90	0.014	7500	320	70	0.011	6400	230	60	0.821
4.0	7200	540	90	0.019	5600	335	70	0.015	4750	240	60	0.857
5.0	6400	580	100	0.023	5100	370	80	0.018	4450	270	70	0.844
6.0	5300	560	100	0.026	4200	350	80	0.021	3700	260	70	0.813
8.0	4000	520	100	0.033	3200	330	80	0.026	2800	240	70	0.750
10.0	3200	480	100	0.038	2550	310	80	0.030	2200	220	70	0.688
12.0	2650	480	100	0.045	2100	300	80	0.036	1860	220	70	0.688
16.0	2000	420	100	0.053	1600	270	80	0.042	1400	200	70	0.625
20.0	1600	380	100	0.059	1300	250	80	0.048	1100	180	70	0.563



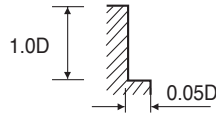
DEVİR = dev/dak  
İLERLEME = mm/dak  
Vc = m/dak  
fz = mm/ağız

## TAVSİYE EDİLEN KESME DEĞERLERİ

### RECOMMENDED CUTTING CONDITIONS

#### PPF - 514 SERİSİ

MALZEME	ALAŞIMSIZ ÇELİKLER ALAŞIMLI ÇELİKLER TAKIM ÇELİKLERİ				ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				SERTLEŞTİRİLMİŞ ÇELİKLER			
	~ Hrc30				Hrc30 ~ Hrc45				Hrc45 ~ Hrc55			
SERTLİK	~ 1000N/mm2				1000 ~ 1500N/mm2				1500 ~ 2000N/mm2			
GÜÇ												
ÇAP	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
2.0	11560	280	75	0.006	7560	170	50	0.006	5040	50	30	0.002
3.0	8920	320	85	0.009	5560	200	50	0.009	3360	60	30	0.004
4.0	7560	570	95	0.019	4620	350	60	0.019	2940	60	35	0.005
5.0	6300	600	100	0.024	3780	360	60	0.024	2320	70	35	0.008
6.0	5560	660	105	0.030	3360	410	65	0.031	2000	80	40	0.010
8.0	4200	710	105	0.042	2520	380	65	0.038	1680	110	40	0.016
10.0	3260	610	100	0.047	2000	300	65	0.038	1360	90	45	0.017
12.0	2740	520	105	0.047	1680	250	65	0.037	1160	80	45	0.017
16.0	2200	410	110	0.047	1360	200	70	0.037	900	60	45	0.017
20.0	1680	320	105	0.048	1060	160	65	0.038	680	40	45	0.015
25.0	1360	250	105	0.046	840	130	65	0.039	540	30	40	0.014

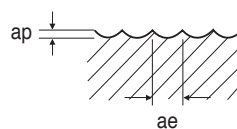


DEVİR = dev/dak  
İLERLEME = mm/dak  
Vc = m/dak  
fz = mm/ağız

#### PPF - 522 SERİSİ

MALZEME	ALAŞIMSIZ ÇELİKLER ALAŞIMLI ÇELİKLER TAKIM ÇELİKLERİ				ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				SERTLEŞTİRİLMİŞ ÇELİKLER					
	~ Hrc30				Hrc30 ~ Hrc40				Hrc45 ~ Hrc65					
SERTLİK	~ 1000N/mm2				1000 ~ 1250N/mm2				1500 ~ 2000N/mm2					
GÜÇ														
ÇAP	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz		
R0.5	x	1.0	15760	250	50	0.008	12720	200	40	0.008	5800	90	20	0.008
R0.75	x	1.5	15760	350	75	0.011	12140	270	55	0.011	5320	120	25	0.011
R1.0	x	2.0	14400	750	90	0.026	10700	490	65	0.023	4680	150	30	0.016
R1.25	x	2.5	14400	750	115	0.026	10700	490	85	0.023	4680	150	35	0.016
R1.5	x	3.0	13100	680	125	0.026	10000	460	95	0.023	4520	150	45	0.017
R2.0	x	4.0	10500	740	130	0.035	8400	530	105	0.032	4200	180	55	0.021
R2.5	x	5.0	9140	820	145	0.045	7300	580	115	0.040	3680	180	60	0.024
R3.0	x	6.0	8490	1020	160	0.060	6900	830	130	0.060	3180	190	60	0.030
R4.0	x	8.0	7160	1290	180	0.090	5770	920	145	0.080	2470	220	62	0.045
R5.0	x	10.0	6370	1530	200	0.120	5090	1020	160	0.100	2040	225	65	0.055
R6.0	x	12.0	5840	1750	220	0.150	4640	1110	175	0.120	1750	245	65	0.070
R8.0	x	16.0	4770	1720	240	0.180	3780	1060	190	0.140	1350	245	70	0.091
R10.0	x	20.0	4140	1660	260	0.200	3260	1040	205	0.160	1110	250	70	0.113

ap: D1~D6=0.2mm  
D8~D20=0.3mm  
ae: 0.2 × D



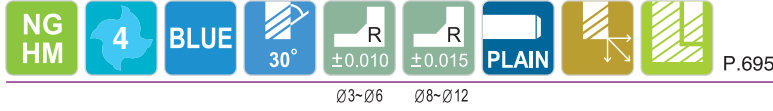
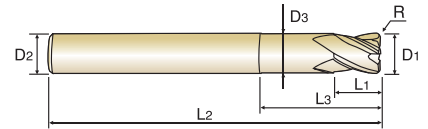
ap: D1~D6=0.2mm  
D8~D20=0.3mm  
ae: 0.1 × D

RPM = rev./min Vc = m/min  
FEED = mm/min. fz = mm/t



## 4 AĞIZLI KAPLAMALI KÖŞE RADÜSLÜ KARBÜR PARMAC FREZE (50-70 HRC) 4 FLUTE COATED CORNER RADIUS CARBIDE END MILL (50-70 HRC)

- Yüksek sertlikteki malzemelerin işlenmesi için tasarlanmıştır
- Yeni geliştirilmiş ham madde ve kaplama yapısı ile yüksek hızlarda ve kuru kesim için uygundur
- Mükemmel son kesim
- Daraltılmış boğaz ile derin yerlere inmek mümkündür
- Yüksek hızlı işlemlerde talaş birikimini engellemek için köşe radyüsü
- Yüksek aşınma direnci
- Designed to machine high hardened materials
- Suitable for dry cutting, high speed cutting thanks to newly developed raw material and new coating
- Excellent workpiece finish
- Deep slotting is possible by reduced neck
- Corner radius for preventing the chipping in high speed machining
- High wear resistance



Ø3-Ø6 Ø8-Ø12

Ölçü : mm

KOD	Küresel Freze Çapı	Freze Çapı	Şaft Çapı	Keme Kenarı Boy	Arka Boyun Çapı	Tam Boy	Boyun Çapı	
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>	
PPF-414030-05R	R0.5	3.0	6	4	10	55	2.85	
PPF-414030-05R-16L	R0.5	3.0	6	4	16	55	2.85	
PPF-414030-05R-20L	R0.5	3.0	6	4	20	55	2.85	
PPF-414040-05R	R0.5	4.0	6	5	12	55	3.85	
PPF-414040-05R-16L	R0.5	4.0	6	5	16	55	3.85	
PPF-414040-05R-20L	R0.5	4.0	6	5	20	55	3.85	
PPF-414060-05R	R0.5	6.0	6	7	20	60	5.85	
PPF-414080-05R	R0.5	8.0	8	9	25	60	7.7	
PPF-414080-1R	R1.0	8.0	8	9	25	60	7.7	
PPF-414100-05R	R0.5	10.0	10	11	32	70	9.7	
PPF-414100-1R	R1.0	10.0	10	11	32	70	9.7	
PPF-414120-05R	R0.5	12.0	12	12	38	80	11.7	
PPF-414120-1R	R0.5	12.0	12	12	38	80	11.7	

Boy	Köşe Radüsü Toleransı (mm)	Freze Çapı Toleransı (mm)	Boyun Çapı Toleransı
Ø6'a kadar	±0.010	0~0.012	h6
Ø6 sonrası	±0.015	0~0.015	

◎ :Mükemmel ○ :iyi

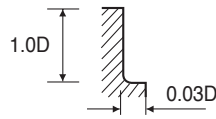
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
		○	○	◎	◎									

**TAVSİYE EDİLEN KESME DEĞERLERİ**  
**RECOMMENDED CUTTING CONDITIONS**

**PPF - 414 (R) SERİSİ**

MALZEME	ALAŞIMLI ÇELİKLER				SERTLEŞTİRİLMİŞ ÇELİKLER							
	SERTLİK	HRc 30 ~ HRc 40				HRc 40 ~ HRc 50				HRc 50 ~ HRc 55		
ÇAP	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
1.0	48000	1184	150	0.006	38000	840	120	0.006	25500	568	80	0.006
2.0	33300	1400	210	0.011	26000	1000	165	0.010	17500	672	110	0.010
3.0	21800	1400	205	0.016	17300	1000	165	0.014	11500	672	110	0.015
4.0	16700	1440	210	0.022	13200	1040	165	0.020	8800	704	110	0.020
5.0	15700	1600	245	0.025	12500	1200	195	0.024	8300	800	130	0.024
6.0	13100	1560	245	0.030	10350	1120	195	0.027	6900	760	130	0.028
8.0	9880	1504	250	0.038	7800	1080	195	0.035	5200	720	130	0.035
10.0	7800	1400	245	0.045	6150	1008	195	0.041	4100	672	130	0.041
12.0	6650	1400	250	0.053	5250	1008	200	0.048	3500	672	130	0.048
16.0	4900	1200	245	0.061	3900	880	195	0.056	2600	584	130	0.056
20.0	3900	1040	245	0.067	3100	776	195	0.063	2050	520	130	0.063

MALZEME	ALAŞIMLI ÇELİKLER				SERTLEŞTİRİLMİŞ ÇELİKLER							
	SERTLİK	HRc 55 ~ HRc 60				HRc 60 ~ HRc 65				HRc 65 ~ HRc 70		
ÇAP	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
1.0	20500	344	65	0.004	16000	216	50	0.003	12500	140	40	0.700
2.0	14500	416	90	0.007	11000	256	70	0.006	9500	184	60	0.657
3.0	9500	416	90	0.011	7500	256	70	0.009	6400	184	60	0.657
4.0	7200	432	90	0.015	5600	268	70	0.012	4750	192	60	0.686
5.0	6400	464	100	0.018	5100	296	80	0.015	4450	216	70	0.675
6.0	5300	448	100	0.021	4200	280	80	0.017	3700	208	70	0.650
8.0	4000	416	100	0.026	3200	264	80	0.021	2800	192	70	0.600
10.0	3200	384	100	0.030	2550	248	80	0.024	2200	176	70	0.550
12.0	2650	384	100	0.036	2100	240	80	0.029	1860	176	70	0.550
16.0	2000	336	100	0.042	1600	216	80	0.034	1400	160	70	0.500
20.0	1600	304	100	0.048	1300	200	80	0.038	1100	144	70	0.450

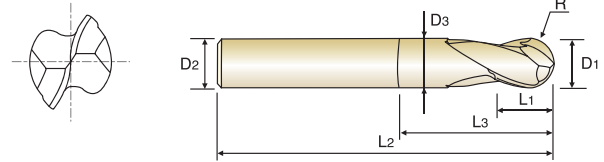


DEVİR = dev/dak  
İLERLEME = mm/dak  
Vc = m/dak  
fz = mm/ağız

## 2 AĞIZLI KÜRESEL KAPLAMALI KARBÜR PARMAC FREZE (50-70 HRC) 2 FLUTE BALL NOSE CARBIDE END MILL (50-70 HRC)

- Yüksek sertlikteki malzemelerin işlenmesi için tasarlanmıştır
- Yeni geliştirilmiş ham madde ve kaplama yapısı ile yüksek hızlarda ve kuru kesimde çalışmaya uygundur
- Mükemmel son kesim
- Yüksek hassasiyetli frezeleme operasyonları için uygunluk
- Yüksek aşınma direnci

- Designed to machine high hardened materials
- Suitable for dry cutting, high speed cutting thanks to newly developed raw material and new coating
- Excellent workpiece finish
- Designed for high precision milling operation
- High wear resistance



Ölçü : mm

KOD	Küresel Freze Çapı	Freze Çapı	Şaft Çapı	Keme Kenarı Boy	Arka Boyun Çapı	Tam Boy	Boyun Çapı	
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>	
PPF-422010	R0.05	1.0	6	1,5	3	50	0.95	
PPF-422015	R0.75	1.5	6	2	4	50	1.45	
PPF-422020	R1.0	2.0	6	2.5	5	50	1.95	
PPF-422025	R1.25	2.5	6	3	7	50	2.4	
PPF-422030	R1.5	3.0	6	4	10	60	2.85	
PPF-422040	R2.0	4.0	6	5	10	60	3.85	
PPF-422050	R2.5	5.0	6	6	12	60	4.85	
PPF-422060	R3.0	6.0	6	7	15	60	5.85	
PPF-422080	R4.0	8.0	8	9	15	80	7.7	
PPF-422100	R5.0	10.0	10	11	25	80	9.7	
PPF-422120	R6.0	12.0	12	14	25	80	11.7	

Boy	Radüs Toleransı (mm)	Freze Çapı Toleransı (mm)	Boyun Çapı Toleransı
R3'e kadar	±0.005	0~0.012	h6
R3 sonrası	±0.010	0~0.015	

◎ :Mükemmel ○ :iyi

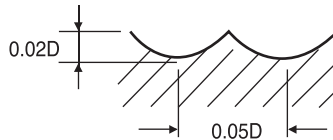
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
		○	○	◎	◎									

**TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS**

**PPF- 422 SERİSİ**

MALZEME			ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				SERTLEŞTİRİLMİŞ ÇELİKLER							
SERTLİK			HRc 30 ~ HRc 40				HRc 40 ~ HRc 50				HRc 50 ~ HRc 55			
ÇAP			Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
R0.1	x	0.2	50000	1200	30	0.012	50000	1050	30	0.011	45000	960	30	0.011
R0.15	x	0.3	50000	1500	45	0.015	50000	1350	45	0.014	45000	1200	40	0.013
R0.2	x	0.4	50000	1900	65	0.019	50000	1700	65	0.017	45000	1500	55	0.017
R0.25	x	0.5	50000	2400	80	0.024	50000	2100	80	0.021	45000	1900	70	0.021
R0.3	x	0.6	50000	2900	95	0.029	50000	2500	95	0.025	45000	2200	85	0.024
R0.4	x	0.8	50000	3900	125	0.039	50000	3300	125	0.033	45000	3000	115	0.033
R0.5	x	1.0	50000	4800	155	0.048	50000	4200	155	0.042	45000	3800	140	0.042
R0.6	x	1.2	50000	5100	190	0.051	48000	4300	180	0.045	43000	3850	160	0.045
R0.75	x	1.5	50000	5400	235	0.054	48000	4500	225	0.047	43000	4000	205	0.047
R1.0	x	2.0	49700	5700	310	0.057	47800	4800	300	0.050	40000	4000	250	0.050
R1.5	x	3.0	33100	6000	310	0.091	31800	5300	300	0.083	26500	4000	250	0.075
R2.0	x	4.0	24900	6000	315	0.120	23900	5300	300	0.111	20000	4000	250	0.100
R2.5	x	5.0	18600	5800	290	0.156	17800	4900	280	0.138	15000	3750	235	0.125
R3.0	x	6.0	13900	4850	260	0.174	13400	4100	255	0.153	11000	3100	205	0.141
R4.0	x	8.0	11100	4200	280	0.189	10700	3500	270	0.164	9000	2700	225	0.150
R5.0	x	10.0	9300	3700	290	0.199	8900	3100	280	0.174	7500	2400	235	0.160
R6.0	x	12.0	6950	2950	260	0.212	6680	2500	250	0.187	5600	1900	210	0.170
R8.0	x	16.0	5570	2650	280	0.238	5350	2200	270	0.206	4500	1700	225	0.189
R10.0	x	20.0	4450	2350	280	0.264	4300	1950	270	0.227	3600	1500	225	0.208

MALZEME			SERTLEŞTİRİLMİŞ ÇELİKLER											
SERTLİK			HRc 55 ~ HRc 60				HRc 60 ~ HRc 65				HRc 65 ~ HRc 70			
ÇAP			Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz	Devir	İlerleme	Vc	fz
R0.1	x	0.2	40000	770	25	0.010	35000	674	20	0.010	31500	570	20	0.009
R0.15	x	0.3	40000	965	40	0.012	35000	840	35	0.012	31500	700	30	0.011
R0.2	x	0.4	40000	1200	50	0.015	35000	1050	45	0.015	31500	890	40	0.014
R0.25	x	0.5	40000	1500	65	0.019	35000	1300	55	0.019	31500	1100	50	0.017
R0.3	x	0.6	40000	1800	75	0.023	35000	1600	65	0.023	31500	1400	60	0.022
R0.4	x	0.8	40000	2400	100	0.030	35000	2100	90	0.030	31500	1800	80	0.029
R0.5	x	1.0	40000	3000	125	0.038	35000	2600	110	0.037	35000	2300	110	0.033
R0.6	x	1.2	38000	3000	145	0.039	34000	2700	130	0.040	30600	2300	115	0.038
R0.75	x	1.5	37000	3100	175	0.042	33000	2700	155	0.041	29700	2300	140	0.039
R1.0	x	2.0	35000	3150	220	0.045	32000	2800	200	0.044	28500	2300	180	0.040
R1.5	x	3.0	23500	3150	220	0.067	21000	2800	200	0.067	19000	2300	180	0.061
R2.0	x	4.0	17500	3150	220	0.090	16000	2800	200	0.088	14500	2300	180	0.079
R2.5	x	5.0	13500	3050	210	0.113	11500	2550	180	0.111	10500	2100	165	0.100
R3.0	x	6.0	10000	2500	190	0.125	8800	2150	165	0.122	8000	1750	150	0.109
R4.0	x	8.0	8000	2150	200	0.134	7000	1850	175	0.132	6500	1550	165	0.119
R5.0	x	10.0	6600	1900	205	0.144	5800	1650	180	0.142	5300	1380	165	0.130
R6.0	x	12.0	5000	1550	190	0.155	4400	1250	165	0.142	4000	1050	150	0.131
R8.0	x	16.0	4000	1350	200	0.169	3500	1000	175	0.143	3200	850	160	0.133
R10.0	x	20.0	3200	1200	200	0.188	2800	800	175	0.143	2550	660	160	0.129

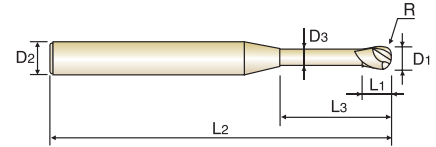
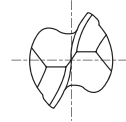


RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz = mm/t

## 2 AĞIZLI KÜRESEL KARBÜR RİB TAKIM 2 FLUTE BALL NOSE RIB TOOL

- Yüksek sıcaklıklarda kuru işlemler için uygundur.
- Mükemmel , yüksek performanslı parmak freze
- Profil ve kontör işleme için dizayn edilmiştir.

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.



P.1078

Ölçü : mm

KOD	Küresel Freze	Freze Çapı	Şaft Çapı	Kesme Kenarı	Arka Boyun Çapı	Tam Boy	Boyun Çapı	
	R (±0.02)	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>	
PPF-32204	R0.2	0.4	4	0.7	2	50	0.37	
PPF-32205	R0.25	0.5	4	0.75	2	50	0.45	
PPF-32206	R0.3	0.6	4	0.9	2	50	0.55	
PPF-32206-4L	R0.3	0.6	4	0.9	4	50	0.55	
PPF-32206-6L	R0.3	0.6	4	0.9	6	50	0.55	
PPF-32208	R0.4	0.8	4	1.2	4	50	0.75	
PPF-32208-8L	R0.4	0.8	4	1.2	8	50	0.75	
PPF-32210	R0.5	1.0	4	1.5	6	50	0.95	
PPF-32210-10L	R0.5	1.0	4	1.5	10	50	0.95	
PPF-32210-12L	R0.5	1.0	4	1.5	12	50	0.95	
PPF-32212	R0.6	1.2	4	1.8	8	50	1.15	
PPF-32215	R0.75	1.5	4	2.3	6	50	1.45	
PPF-32215-12L	R0.75	1.5	4	2.3	12	50	1.45	
PPF-32215-20L	R0.75	1.5	4	2.3	20	50	1.45	
PPF-32216	R0.8	1.6	4	2.4	8	50	1.55	
PPF-32216-16L	R0.8	1.6	4	2.4	16	50	1.55	
PPF-32220	R1.0	2.0	4	3	8	50	1.95	
PPF-32220-10L	R1.0	2.0	4	3	10	50	1.95	
PPF-32220-12L	R1.0	2.0	4	3	12	50	1.95	
PPF-32220-16L	R1.0	2.0	4	3	16	50	1.95	
PPF-32220-20L	R1.0	2.0	4	3	20	50	1.95	
PPF-32230	R1.5	3.0	6	4.5	10	50	2.85	
PPF-32230-16L	R1.5	3.0	6	4.5	16	60	2.85	
PPF-32230-20L	R1.5	3.0	6	4.5	20	60	2.85	
PPF-32230-25L	R1.5	3.0	6	4.5	25	75	2.85	
PPF-32240	R2.0	4.0	6	6	12	50	3.85	
PPF-32240-20L	R2.0	4.0	6	6	20	75	3.85	
PPF-32240-30L	R2.0	4.0	6	6	30	75	3.85	

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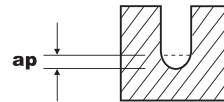
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
©	©	©				○		○	○	○				

TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS

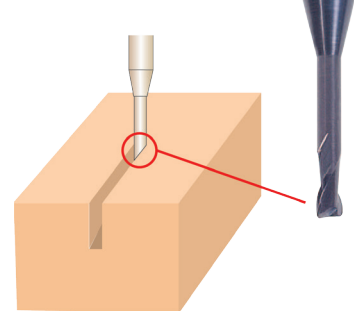
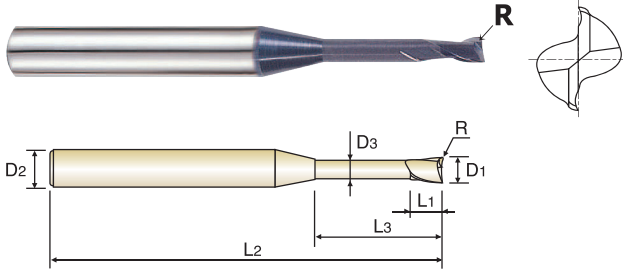
## PPF- 322 SERİSİ

MALZEME	ALAŞIMSIZ ÇELİKLER ALAŞIMLI ÇELİKLER				
SERTLİK	~ HRC30				
ÇAP	Devir	İlerleme	ap (mm)	Vc	fz
0.4	26350~34000	150~415	0.018~0.036	33~43	0.003~0.006
0.5	26350~34000	150~415	0.023~0.045	41~53	0.003~0.006
0.6	26350~34000	190~535	0.027~0.054	50~64	0.004~0.008
0.8	26350~34000	190~535	0.036~0.072	66~85	0.004~0.008
1.0	24650~31000	210~595	0.045~0.090	77~97	0.004~0.010
1.2	20500~26000	210~665	0.055~0.100	77~98	0.005~0.013
1.4	18000~22000	210~665	0.062~0.125	79~97	0.006~0.015
1.5	16000~20500	210~665	0.070~0.135	75~97	0.007~0.016
1.6	15500~20000	210~665	0.075~0.145	78~101	0.007~0.017
1.8	14500~18200	210~665	0.080~0.160	82~103	0.007~0.018
2.0	13000~16000	210~665	0.090~0.180	82~101	0.008~0.021
3.0	9000~11000	210~665	0.135~0.270	85~104	0.012~0.030
4.0	7200~9350	210~665	0.180~0.360	90~117	0.015~0.036

MALZEME	ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				
SERTLİK	HRC30 ~ HRC45				
ÇAP	Devir	İlerleme	ap (mm)	Vc	fz
0.4	19100~24200	75~230	0.018~0.036	24~30	0.002~0.005
0.5	19100~24200	75~230	0.023~0.045	30~38	0.002~0.005
0.6	19100~24200	95~300	0.027~0.054	36~46	0.002~0.006
0.8	19100~24200	95~300	0.036~0.072	48~61	0.002~0.006
1.0	17400~22100	105~330	0.045~0.090	55~69	0.003~0.007
1.2	14500~18300	105~330	0.055~0.100	55~69	0.004~0.009
1.4	12800~15300	105~330	0.062~0.125	56~67	0.004~0.011
1.5	11500~14900	105~330	0.070~0.135	54~70	0.005~0.011
1.6	11200~14000	105~330	0.075~0.145	56~70	0.005~0.012
1.8	10200~12800	105~330	0.080~0.160	58~72	0.005~0.013
2.0	9400~11500	105~330	0.090~0.180	59~72	0.006~0.014
3.0	6000~11500	105~330	0.135~0.270	57~108	0.009~0.014
4.0	5000~6600	105~330	0.180~0.360	63~83	0.011~0.025



DEVİR=dev/dak  
İLERLEME=mm/dak  
Vc=m/dak  
fz=mm/ağız

**PRO-X****PARMAK FREZELER  
END MILLS****2 AĞIZLI KÖŞE RADÜSLÜ KARBÜR RİB TAKIM  
2 FLUTE CORNER RADIUS CARBIDE RIB TOOL**

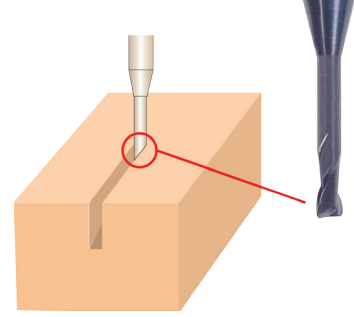
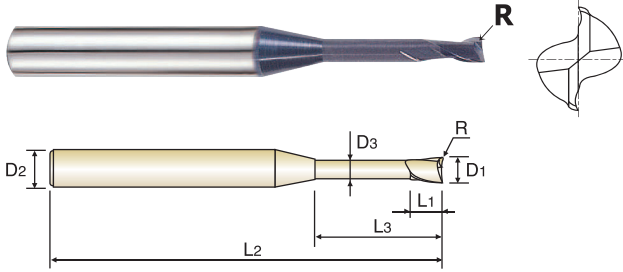
Ölçü : mm

KOD	Küresel Freze	Freze Çapı	Şaft Çapı	Kesme Kenarı	Arka Boyun Çapı	Tam Boy	Boyun Çapı	
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>	
PPF-31206	RO.05	0.6	4	0.9	2	45	0.55	
PPF-31206-4L	RO.05	0.6	4	0.9	4	45	0.55	
PPF-31208	RO.01	0.8	4	1.2	4	45	0.75	
PPF-31208-8L	RO.01	0.8	4	1.2	8	45	0.75	
PPF-31208-12L	RO.01	0.8	4	1.2	12	45	0.75	
PPF-31210	RO.01	1.0	4	1.5	6	45	0.95	
PPF-31210-8L	RO.01	1.0	4	1.5	8	45	0.95	
PPF-31210-10L	RO.01	1.0	4	1.5	10	45	0.95	
PPF-31210-12L	RO.01	1.0	4	1.5	12	45	0.95	
PPF-31210-16L	RO.01	1.0	4	1.5	16	50	0.95	
PPF-31210-20L	RO.01	1.0	4	1.5	20	55	0.95	
PPF-31215	RO.02	1.5	4	2.3	6	45	1.45	
PPF-31215-8L	RO.02	1.5	4	2.3	8	45	1.45	
PPF-31215-10L	RO.02	1.5	4	2.3	10	45	1.45	
PPF-31215-12L	RO.02	1.5	4	2.3	12	45	1.45	
PPF-31215-16L	RO.02	1.5	4	2.3	16	50	1.45	
PPF-31215-20L	RO.02	1.5	4	2.3	20	55	1.45	
PPF-31220	RO.02	2.0	4	3	8	45	1.95	
PPF-31220-6L	RO.02	2.0	4	3	10	45	1.95	

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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRC30~40	HRC40~45	HRc45~55	HRC55~70									
○	◎	◎	◎	○				○						



**PRO-X****PARMAK FREZELER  
END MILLS****2 AĞIZLI KÖŞE RADÜSLÜ KARBÜR RİB TAKIM  
2 FLUTE CORNER RADIUS CARBIDE RIB TOOL**

Ölçü : mm

KOD	Küresel Freze	Freze Çapı	Şaft Çapı	Kesme Kenarı	Arka Boyun Çapı	Tam Boy	Boyun Çapı	
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>	
PPF-31220-10L	RO.02	2.0	4	3	10	45	1.95	
PPF-31220-12L	RO.02	2.0	4	3	12	45	1.95	
PPF-31220-16L	RO.02	2.0	4	3	16	50	1.95	
PPF-31220-20L	RO.02	2.5	4	3.7	20	55	1.95	
PPF-31225-8L	RO.02	2.5	4	3.7	8	45	2.40	
PPF-31225	RO.02	2.5	4	3.7	10	45	2.40	
PPF-31225-16L	RO.03	3.0	6	4.5	16	55	2.40	
PPF-31230	RO.03	3.0	6	4.5	8	45	2.85	
PPF-31230-10L	RO.03	3.0	6	4.5	10	45	2.85	
PPF-31230-12L	RO.03	3.0	6	4.5	12	45	2.85	
PPF-31230-16L	RO.03	3.0	6	4.5	16	55	2.85	
PPF-31230-20L	RO.03	3.0	6	4.5	20	60	2.85	
PPF-31240	RO.03	3.0	6	4.5	12	50	3.85	
PPF-31240-16L	RO.03	4.0	6	6	16	50	3.85	
PPF-31240-20L	RO.03	4.0	6	6	20	60	3.85	
PPF-31230-30L	RO.03	3.0	6	4.5	30	70	2.85	
PPF-31230-40L	RO.03	4.0	6	6	40	90	2.85	
PPF-31240-30L	RO.03	4.0	6	6	30	70	3.85	
PPF-31240-40L	RO.03	4.0	6	6	40	90	3.85	

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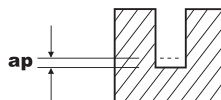
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
-HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70									
○	◎	◎	◎	○				○						

**TAVSİYE EDİLEN KESME DEĞERLERİ**  
**RECOMMENDED CUTTING CONDITIONS**

**PPF- 312 SERİSİ**

MALZEME	ALAŞIMSIZ ÇELİKLER ALAŞIMLI ÇELİKLER DÖKME DEMİR					ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				
	~ HRc30					HRc30 ~ HRc45				
SERTLİK	~ 1000N/mm <sup>2</sup>					1000 ~ 1500N/mm <sup>2</sup>				
GÜÇ										
ÇAP	Devir	İlerleme	ap (mm)	Vc	fz	Devir	İlerleme	ap (mm)	Vc	fz
0.4	31000-40000	200-440	0.007~0.018	39-50	0.003~0.006	22500-28000	85-340	0.007~0.018	28-35	0.002~0.006
0.5	31000-40000	200-440	0.009~0.022	49-63	0.003~0.006	22500-28000	85-340	0.009~0.022	35-44	0.002~0.006
0.6	31000-40000	250-570	0.011~0.026	58-75	0.004~0.007	22500-28000	110-430	0.011~0.026	42-53	0.002~0.008
0.7	31000-40000	250-570	0.012~0.031	68-88	0.004~0.007	22500-28000	110-430	0.012~0.031	49-62	0.002~0.008
0.8	27000-35000	280-630	0.014~0.035	68-88	0.005~0.009	19500-24500	120-480	0.014~0.035	49-62	0.003~0.010
0.9	25000-31500	280-720	0.030~0.060	71-98	0.006~0.010	17500-22500	160-540	0.030~0.060	49-64	0.005~0.012
1.0	22500-28000	280-810	0.045~0.090	71-88	0.006~0.014	15700-20000	190-600	0.045~0.090	49-63	0.006~0.015
1.2	18500-22500	280-900	0.055~0.100	70-85	0.008~0.020	13000-16500	190-600	0.055~0.100	49-62	0.007~0.018
1.4	16000-20000	280-900	0.062~0.125	70-88	0.009~0.023	11500-14000	190-600	0.062~0.125	51-62	0.008~0.021
1.5	14500-18500	280-900	0.070~0.135	68-87	0.010~0.024	10500-13500	190-600	0.070~0.135	49-64	0.009~0.022
1.6	14000-18000	280-900	0.075~0.145	70-90	0.010~0.025	10200-12800	190-600	0.075~0.145	51-64	0.009~0.023
1.8	13000-16500	280-900	0.080~0.160	74-93	0.011~0.027	9200-11500	190-600	0.080~0.160	52-65	0.010~0.026
2.0	12000-14500	280-900	0.090~0.180	75-91	0.012~0.031	8300-10500	190-600	0.090~0.180	52-66	0.011~0.029
2.5	9500-12000	280-900	0.112~0.235	75-94	0.015~0.038	6700-8500	190-600	0.112~0.235	53-67	0.014~0.035
3.0	8000-10000	280-900	0.135~0.270	75-94	0.018~0.045	5500-7000	190-600	0.135~0.270	52-66	0.017~0.043
4.0	6000-7500	280-900	0.180~0.360	75-94	0.023~0.060	4100-5300	190-600	0.180~0.360	52-67	0.023~0.057
5.0	4800-6000	280-900	0.225~0.450	75-94	0.029~0.075	3300-4200	190-600	0.225~0.450	52-66	0.029~0.071
6.0	4000-5000	280-900	0.270~0.540	75-94	0.035~0.090	2800-3500	190-600	0.270~0.540	53-66	0.034~0.086

MALZEME	SERTLEŞTİRİLMİŞ ÇELİKLER					
	HRc45 ~ HRc55					
SERTLİK	1500 ~ 2000N/mm <sup>2</sup>					
GÜÇ						
ÇAP	Devir	İlerleme	ap (mm)	Vc	fz	
0.4	14300-17000	30-90	0.004~0.008	18-21	0.001~0.003	
0.5	14300-17000	30-90	0.004~0.009	22-27	0.001~0.003	
0.6	14300-17000	40-110	0.005~0.011	27-32	0.001~0.003	
0.7	14300-17000	40-110	0.006~0.013	31-37	0.001~0.003	
0.8	12500-14800	45-125	0.007~0.015	31-37	0.002~0.004	
0.9	11000-12500	55-130	0.008~0.016	31-35	0.003~0.005	
1.0	10000-12500	65-130	0.009~0.018	31-39	0.003~0.005	
1.2	8300-10500	65-130	0.010~0.022	31-40	0.004~0.006	
1.4	7200-9000	65-130	0.012~0.025	32-40	0.005~0.007	
1.5	6700-8200	65-130	0.014~0.028	32-39	0.005~0.008	
1.6	6400-8000	65-130	0.015~0.030	32-40	0.005~0.008	
1.8	5700-7200	65-130	0.016~0.032	32-41	0.006~0.009	
2.0	5300-6600	65-130	0.018~0.035	33-41	0.006~0.010	
2.5	4300-5300	65-130	0.022~0.045	34-42	0.008~0.012	
3.0	3500-4400	65-130	0.028~0.055	33-41	0.009~0.015	
4.0	2600-3300	65-130	0.036~0.072	33-41	0.013~0.020	
5.0	2100-2600	65-130	0.045~0.090	33-41	0.015~0.025	
6.0	1750-2600	65-130	0.054~0.108	33-49	0.019~0.025	



DEVİR=dev/dak  
İLERLEME=mm/dak

Vc=m/dak  
fz=mm/ağız

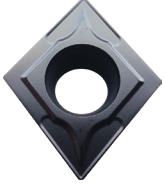


**PRO-X**



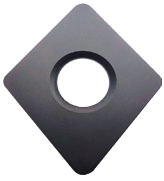
**4**

**SERT METAL KESİCİ UÇLAR**  
**CARBIDE INSERTS**

TORNALAMA UÇLARI  
TURNING INSERTS

## CCMT

KOD	Stok İsmi	Malzeme Önerisi			
PKU-110002	CCMT 060204 PPF DMK15			■	
PKU-110001	CCMT 060204 PPF DMP25	■			
PKU-110050	CCMT 09T304 PPF DMM25	■	■		
PKU-110004	CCMT 09T304 PPF DMK15			■	
PKU-110003	CCMT 09T304 PPF DMP25	■			
PKU-110051	CCMT 09T308 PPF DMM25	■	■		
PKU-110006	CCMT 09T308 PPF DMK15			■	
PKU-110005	CCMT 09T308 PPF DMP25	■			
PKU-110052	CCMT 120404 PPF DMM25	■	■		
PKU-110008	CCMT 120404 PPF DMK15			■	
PKU-110007	CCMT 120404 PPF DMP25	■			
PKU-110053	CCMT 120408 PPF DMM25	■	■		
PKU-110010	CCMT 120408 PPF DMK15			■	
PKU-110009	CCMT 120408 PPF DMP25	■			



## CNMA

KOD	Stok İsmi	Malzeme Önerisi			
PKU-110011	CNMA 120408 DMK15			■	
PKU-110012	CNMA 120412 DMK15			■	

## MALZEME ÖNERİSİ

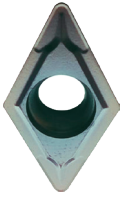
■ ÇELİK	■ DÖKME DEMİR	■ SERTLEŞTİRİLMİŞ MALZEME
■ PASLANMAZ ÇELİK	■ YÜKSEK SICAKLIK ALAŞIMLARI	■ ALÜMİNYUM (>8%Si)

**TORNALAMA UÇLARI  
TURNING INSERTS**



**C N M G**

KOD	Stok İsmi	Malzeme Önerisi							
PKU-110048	CNMG 120404 PF DMM25	■ ■							
PKU-110014	CNMG 120404 PF DMP25	■							
PKU-110071	CNMG 120408 PR DMK15			■					
PKU-110049	CNMG 120408 PF DMM25	■ ■							
PKU-110016	CNMG 120408 PF DMP25	■							
PKU-110015	CNMG 120408 PM DMP25	■							
PKU-110072	CNMG 120412 PR DMK15			■					
PKU-110080	CNMG 160608 PM DMP25	■							
PKU-110060	CNMG 160612 PM DMP25	■							
PKU-110013	CNMG 190608 PM DMK15			■					
PKU-110067	CNMG 190608 PM DMP25	■							
PKU-110081	CNMG 190616 PM DMP25	■							



**D C M T**

KOD	Stok İsmi	Malzeme Önerisi							
PKU-110017	DCMT 070204 PPF DMP25	■							
PKU-110056	DCMT 11T304 PPF DMM25	■ ■							
PKU-110019	DCMT 11T304 PPF DMK15			■					
PKU-110018	DCMT 11T304 PPF DMP25	■							
PKU-110057	DCMT 11T308 PPF DMM25	■ ■							
PKU-110020	DCMT 11T308 PPF DMP25	■							

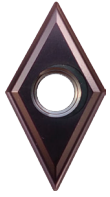
**MALZEME ÖNERİSİ**

- ÇELİK
- DÖKME DEMİR
- SERTLEŞTİRİLMİŞ MALZEME
- PASLANMAZ ÇELİK
- YÜKSEK SICAKLIK ALAŞIMLARI
- ALÜMİNYUM (>8%Si)

TORNALAMA UÇLARI  
TURNING INSERTS

## DNMA

KOD	Stok İsmi	Malzeme Önerisi
PKU-110021	DNMA 150604 DMK15	■
PKU-110022	DNMA 150608 DMK15	■
PKU-110023	DNMA 150612 DMK15	■



## DNMG

KOD	Stok İsmi	Malzeme Önerisi
PKU-110054	DNMG 150604 PM DMM25	■ ■
PKU-110024	DNMG 150604 PM DMP25	■
PKU-110073	DNMG 150608 PR DMK15	■
PKU-110055	DNMG 150608 PM DMM25	■ ■
PKU-110025	DNMG 150608 PM DMP25	■
PKU-110074	DNMG 150612 PR DMK15	■



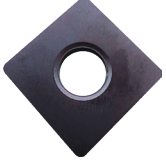
## KNUX

KOD	Stok İsmi	Malzeme Önerisi
PKU-110078	KNUX160405 L NN DMG20	■ ■ ■ ■ ■ ■
PKU-110079	KNUX160405 R NN DMG20	■ ■ ■ ■ ■ ■

## MALZEME ÖNERİSİ

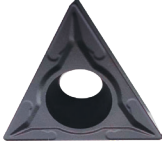
■ ÇELİK	■ DÖKME DEMİR	■ SERTLEŞTİRİLMİŞ MALZEME
■ PASLANMAZ ÇELİK	■ YÜKSEK SICAKLIK ALAŞIMLARI	■ ALÜMİNYUM (>8%Si)



TORNALAMA UÇLARI  
TURNING INSERTS

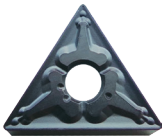
## S N M A

KOD	Stok İsmi	Malzeme Önerisi						
PKU-110026	SNMA 190612 DMK15							



## T C M T

KOD	Stok İsmi	Malzeme Önerisi						
PKU-110027	TCMT 16T304 PPF DMP25							
PKU-110028	TCMT 16T308 PPF DMP25							



## T N M G

KOD	Stok İsmi	Malzeme Önerisi						
PKU-110030	TNMG 160404 PF DMP25							
PKU-110029	TNMG 160404 PM DMP25							
PKU-110032	TNMG 160408 PF DMP25							
PKU-110031	TNMG 160408 PM DMP25							
PKU-110082	TNMG 220408 PF DMG20							

TORNALAMA UÇLARI  
TURNING INSERTS

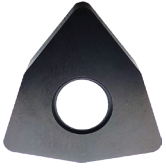
## V B M T

KOD	Stok İsmi	Malzeme Önerisi							
PKU-110033	VBMT 160404 PPF DMP25	■							
PKU-110034	VBMT 160408 PPF DMP25	■							
PKU-110066	VBMT 160408 PPF DMM25	■	■						



## V N M G

KOD	Stok İsmi	Malzeme Önerisi							
PKU-110068	VNMG 160404 PF DMP25	■							
PKU-110069	VNMG 160408 PF DMP25	■							

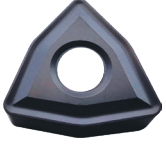


## W N M A

KOD	Stok İsmi	Malzeme Önerisi							
PKU-110035	WNMA 080408 DMK15				■				
PKU-110036	WNMA 080412 DMK15				■				

## MALZEME ÖNERİSİ

■ ÇELİK	■ DÖKME DEMİR	■ SERTLEŞTİRİLMİŞ MALZEME
■ PASLANMAZ ÇELİK	■ YÜKSEK SICAKLIK ALAŞIMLARI	■ ALÜMİNYUM (>8%Si)

TORNALAMA UÇLARI  
TURNING INSERTS

## W N M G

KOD	Stok İsmi	Malzeme Önerisi						
PKU-110058	WNMG 080404 PF DMM25	■	■					
PKU-110038	WNMG 080404 PF DMP25	■						
PKU-110037	WNMG 080404 PM DMP25	■						
PKU-110075	WNMG 080408 PR DMK15			■				
PKU-110059	WNMG 080408 PF DMM25	■	■					
PKU-110040	WNMG 080408 PF DMP25	■						
PKU-110042	WNMG 080408 PF DMP25	■						
PKU-110041	WNMG 080408 PM DMP25	■						
PKU-110076	WNMG 080412 PR DMK15			■				
PKU-110077	WNMG 080412 PF DMM25	■	■					
PKU-110063	WNMG 080412 PF DMP25	■						

## MALZEME ÖNERİSİ

■ ÇELİK

■ DÖKME DEMİR

■ SERTLEŞTİRİLMİŞ MALZEME

■ PASLANMAZ ÇELİK

■ YÜKSEK SICAKLIK ALAŞIMLARI

■ ALÜMİNYUM (&gt;8%Si)

FREZELEME UÇLARI  
MILLING INSERTS

## 3 P K T

KOD	Stok İsmi	Malzeme Önerisi
PKU-210001	3PKT 100404R-M DMG20	<span style="color: blue;">■</span> <span style="color: yellow;">■</span> <span style="color: red;">■</span> <span style="color: orange;">■</span> <span style="color: gray;">■</span> <span style="color: green;">■</span>
PKU-210002	3PKT 150508R-M DMG20	<span style="color: blue;">■</span> <span style="color: yellow;">■</span> <span style="color: red;">■</span> <span style="color: orange;">■</span> <span style="color: gray;">■</span> <span style="color: green;">■</span>



## A P K T

KOD	Stok İsmi	Malzeme Önerisi
PKU-210025	APKT 100308 PDTR DMG20	<span style="color: blue;">■</span> <span style="color: yellow;">■</span> <span style="color: red;">■</span> <span style="color: orange;">■</span> <span style="color: gray;">■</span> <span style="color: green;">■</span>
PKU-210022	APKT 1604 PDTR DMG20	<span style="color: blue;">■</span> <span style="color: yellow;">■</span> <span style="color: red;">■</span> <span style="color: orange;">■</span> <span style="color: gray;">■</span> <span style="color: green;">■</span>



## L N M U

KOD	Stok İsmi	Malzeme Önerisi
PKU-210019	LNMU 0303 ZER-PM UN330	<span style="color: blue;">■</span> <span style="color: yellow;">■</span> <span style="color: red;">■</span> <span style="color: orange;">■</span> <span style="color: gray;">■</span> <span style="color: green;">■</span>

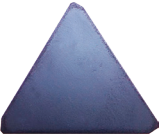
## MALZEME ÖNERİSİ

<span style="color: blue;">■</span> ÇELİK	<span style="color: red;">■</span> DÖKME DEMİR	<span style="color: gray;">■</span> SERTLEŞTİRİLMİŞ MALZEME
<span style="color: yellow;">■</span> PASLANMAZ ÇELİK	<span style="color: orange;">■</span> YÜKSEK SICAKLIK ALAŞIMLARI	<span style="color: green;">■</span> ALÜMİNYUM (>8%Si)

FREZELEME UÇLARI  
MILLING INSERTS

## RDMT

KOD	Stok İsmi	Malzeme Önerisi
PKU-210023	RDMT 10T3 M0 DMG20	<span style="color:blue">■</span> <span style="color:yellow">■</span> <span style="color:red">■</span> <span style="color:orange">■</span> <span style="color:gray">■</span> <span style="color:green">■</span>
PKU-210024	RDMT 1204 M0 DMG20	<span style="color:blue">■</span> <span style="color:yellow">■</span> <span style="color:red">■</span> <span style="color:orange">■</span> <span style="color:gray">■</span> <span style="color:green">■</span>



## TPKN

KOD	Stok İsmi	Malzeme Önerisi
PKU-210012	TPKN 1603 PDTR DMG20	<span style="color:blue">■</span> <span style="color:yellow">■</span> <span style="color:red">■</span> <span style="color:orange">■</span> <span style="color:gray">■</span> <span style="color:green">■</span>
PKU-210013	TPKN 2204 PDTR DMG20	<span style="color:blue">■</span> <span style="color:yellow">■</span> <span style="color:red">■</span> <span style="color:orange">■</span> <span style="color:gray">■</span> <span style="color:green">■</span>



## WNMX

KOD	Stok İsmi	Malzeme Önerisi
PKU-210020	WNMX 09T316 ZNN UN330	<span style="color:blue">■</span> <span style="color:yellow">■</span> <span style="color:red">■</span> <span style="color:orange">■</span> <span style="color:gray">■</span> <span style="color:green">■</span>

## MALZEME ÖNERİSİ

<span style="color:blue">■</span> ÇELİK	<span style="color:red">■</span> DÖKME DEMİR	<span style="color:gray">■</span> SERTLEŞTİRİLMİŞ MALZEME
<span style="color:yellow">■</span> PASLANMAZ ÇELİK	<span style="color:orange">■</span> YÜKSEK SICAKLIK ALAŞIMLARI	<span style="color:green">■</span> ALÜMİNYUM (>8%Si)

## KESME ve KANAL UÇMA

## PARTING AND GROOVING INSERTS



## D G N

KOD	Stok İsmi	Malzeme Önerisi
PKU-410001	DGN 3102C DMP25K	■ ■ ■ ■ ■ ■



## M G M N

KOD	Stok İsmi	Malzeme Önerisi
PKU-410002	MGMN 200 DMP25K	■ ■ ■ ■ ■ ■
PKU-410003	MGMN 300 DMP25K	■ ■ ■ ■ ■ ■
PKU-410004	MGMN 400 DMP25K	■ ■ ■ ■ ■ ■

## MALZEME ÖNERİSİ

■ ÇELİK	■ DÖKME DEMİR	■ SERTLEŞTİRİLMİŞ MALZEME
■ PASLANMAZ ÇELİK	■ YÜKSEK SICAKLIK ALAŞIMLARI	■ ALÜMİNYUM (>8%Si)

## DELME UÇLARI

## DRILLING INSERTS



## S P G T

KOD	Stok İsmi	Malzeme Önerisi
PKU-210006	SPGT 050204 DMG20	■ ■ ■ ■ ■ ■
PKU-210007	SPGT 060204 DMG20	■ ■ ■ ■ ■ ■
PKU-210008	SPGT 07T308 DMG20	■ ■ ■ ■ ■ ■
PKU-210009	SPGT 090408 DMG20	■ ■ ■ ■ ■ ■
PKU-210010	SPGT 110408 DMG20	■ ■ ■ ■ ■ ■



## W C M X

KOD	Stok İsmi	Malzeme Önerisi
PKU-210017	WCMX 030208 DMG20	■ ■ ■ ■ ■ ■
PKU-210018	WCMX 040208 DMG20	■ ■ ■ ■ ■ ■
PKU-210014	WCMT 050308 DMG20	■ ■ ■ ■ ■ ■
PKU-210015	WCMT 06T308 DMG20	■ ■ ■ ■ ■ ■
PKU-210016	WCMT 080412 DMG20	■ ■ ■ ■ ■ ■

## MALZEME ÖNERİSİ

■ ÇELİK

■ DÖKME DEMİR

■ SERTLEŞTİRİLMİŞ MALZEME

■ PASLANMAZ ÇELİK

■ YÜKSEK SICAKLIK ALAŞIMLARI

■ ALÜMİNYUM (&gt;8%Si)



**TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS**

MALZEME GRUBU	SERTLİK	KALİTE	KESME HIZI V <sub>c</sub>	İLERLEME f <sub>z</sub>
Alaşsız Çelikler	125-250	DMP25	200-240	0,11 -0,23
Düşük Alaşlı Çelikler	180-350	DMP25	130-200	0,09-0,20
Yüksek Alaşlı Çelikler	220-350	DMP25	90-140	0,09-0,18

\*DMP15 kalite için kesme hızı ve ilerleme değerleri 15% oranında artırılmalıdır.

Östenitik Paslanmaz Çelik	≤ 200 HB	DMM25	200 ( 150-250)	0,20 ( 0,10- 0,30)
	> 200 HB	DMM25	150 ( 100-200)	0,20 ( 0,10- 0,30)
Ferritik & Martenzitik Paslanmaz Çelik	≤ 200 HB	DMM25	200 ( 150-250)	0,20 ( 0,10- 0,30)
	> 200 HB	DMM25	150 ( 100-200)	0,20 ( 0,10- 0,30)
Duplex Paslanmaz Çelik	≤ 280 HB	DMM25	140 ( 100 - 180)	0,15 ( 0,05-0,25)
	< 450 HB	DMM25	130 (100-160)	0,15 ( 0,05-0,25)

Gri Dökme Demir	180	DMK15	210-540	0,1-0,5
	260	DMK15	140-280	0,1-0,5
Küresel Grafitli Dökme Demir	160	DMK15	140-290	0,1-0,5
	250	DMK15	100-210	0,1-0,5
Dövülebilir Dökme Demir	130	DMK15	210-320	0,1-0,5
	230	DMK15	100-230	0,1-0,5











**PRO-X**

KESİCİ TAKIMLAR KATALOĐU

