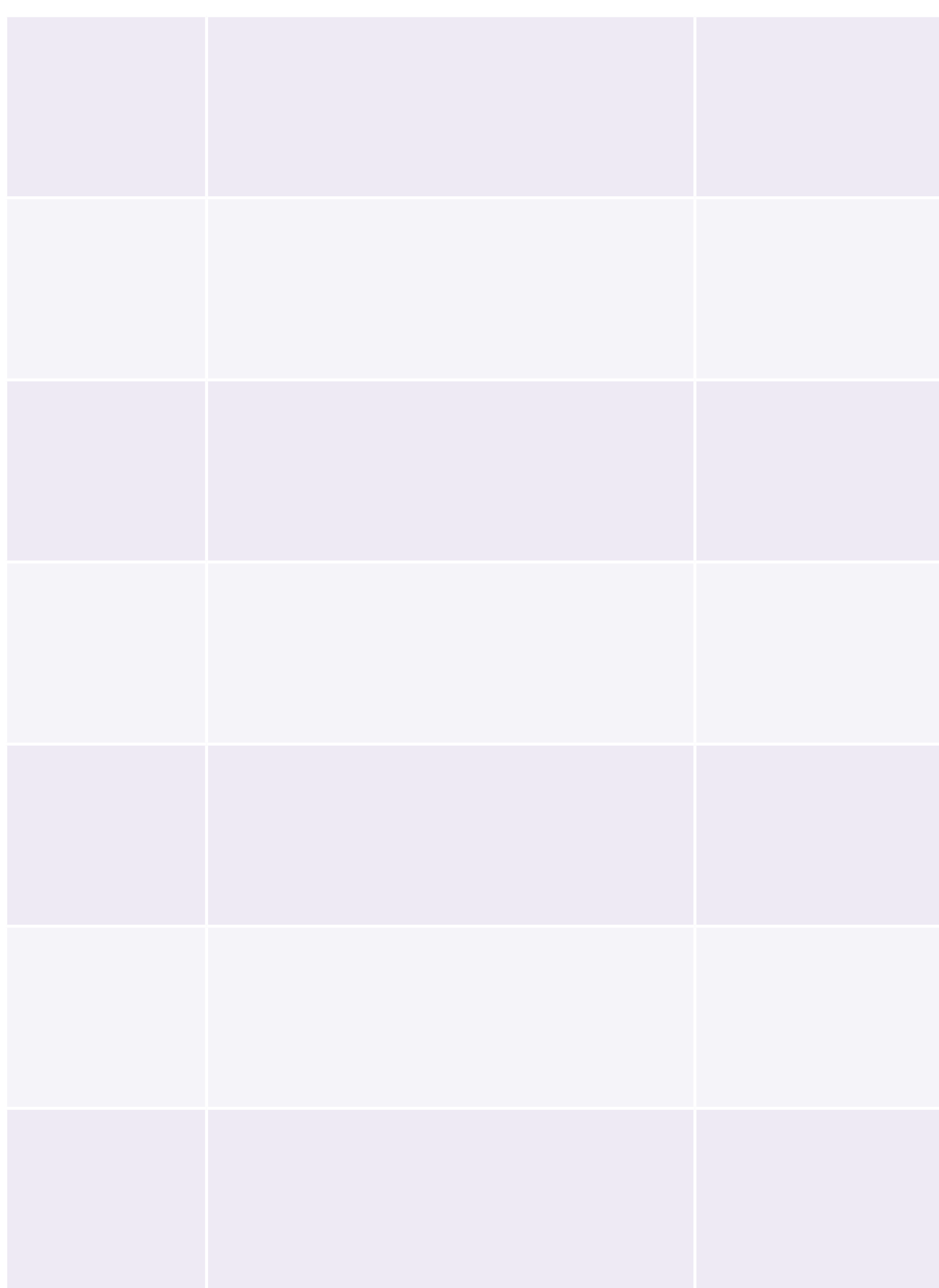


# PRO-X

## Kesici Takımlar Katalođu



2018



İçindekiler

1

MATKAPLAR  
DRILLS

03-24

2

KILAVUZLAR  
TAPS

25-46

3

PARMAK FREZELER  
END MILLS

47-70

4

PENSLER  
COLLETS

71-78

5

TUTUCULAR  
CHUCKS

79-106

6

TORNA AYNALARI  
LATHE CHUCKS

107-112

7

MANDRENLER  
KEYLESS CHUCKS

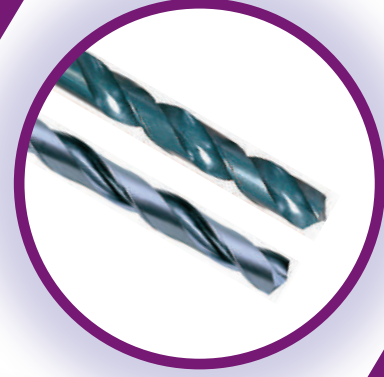
113-116





**PRO-X**

MATKAPLAR  
DRILLS  
1



1

**MATKAPLAR  
DRILLS**

## HSS, SİLİNDİRİK SAPLI MATKAP UCU

### HSS, STRAIGHT SHANK TWIST DRILLS

► **Yüzey Uygulaması:** Parlak Yüzey

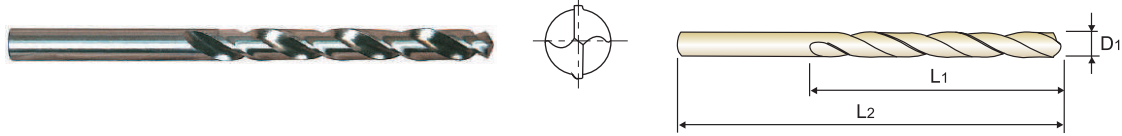
► **Surface treatment :** Bright Finish

► **Kullanım Yerleri :** Çelik , alaşımlı ve alaşımsız çelik döküm, gri dökme demir , dövülebilir dökme demir ve grafit

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

: İsteğe göre buhar menevişli kaplama seçeneği

: Black oxide finish is available on request



Ölçü : mm

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D1	L1	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

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D1	L1	L2
PMA-1040	1.0	12	34
PMA-1041	1.1	14	36
PMA-1042	1.2	16	38
PMA-1043	1.3	18	38
PMA-1044	1.4	18	40
PMA-1045	1.5	20	40
PMA-1046	1.6	20	43
PMA-1047	1.7	22	43
PMA-1048	1.8	22	46
PMA-1049	1.9	24	49
PMA-1050	2.0	24	49
PMA-1051	2.1	24	49
PMA-1052	2.2	27	53
PMA-1053	2.3	27	53
PMA-1054	2.4	30	57
PMA-1055	2.5	30	57
PMA-1056	2.6	30	57
PMA-1057	2.7	33	61
PMA-1058	2.8	33	61
PMA-1059	2.9	33	61
PMA-1060	3.0	33	61
PMA-1061	3.1	36	65
PMA-1062	3.2	36	65
PMA-1063	3.3	36	65
PMA-1064	3.4	39	70
PMA-1065	3.5	39	70
PMA-1066	3.6	39	70
PMA-1067	3.7	39	70
PMA-1068	3.8	43	75
PMA-1069	3.9	43	75

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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, SİLİNDİRİK SAPLI MATKAP UCU

### HSS, STRAIGHT SHANK TWIST DRILLS

► **Yüzey Uygulaması:** Parlak Yüzey

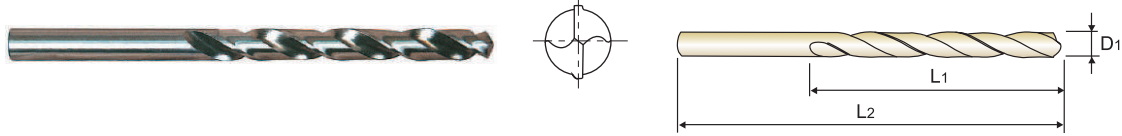
► **Surface treatment :** Bright Finish

► **Kullanım Yerleri :** Çelik , alaşımlı ve alaşımsız çelik döküm, gri dökme demir , dövülebilir dökme demir ve grafit

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

: İsteğe göre buhar menevişli kaplama seçeneği

: Black oxide finish is available on request



Ölçü : mm

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D1	L1	L2
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
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

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D1	L1	L2
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
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

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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~								
◎	◎				○	○	○	○	○			

**PRO-X** MATKAPLAR  
DRILLS

**HSSCo8 SILINDIRIK SAPLI UZUN MATKAP UCU**

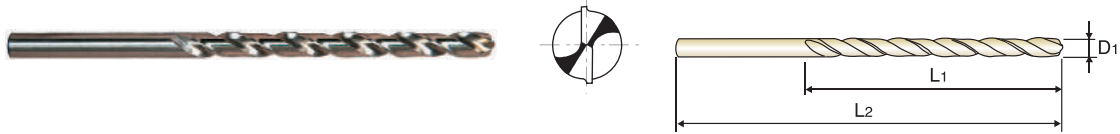
**HSSCo8, STRAIGHT SHANK TWIST DRILLS**

► **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	Kesme Kenarı Boyu	Tam Boy
	D1	L1	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	Kesme Kenarı Boyu	Tam Boy
	D1	L1	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~								
◎	◎				○	○	◎	○	○			

## HSSCo8 SILINDIRIK SAPLI UZUN MATKAP UCU

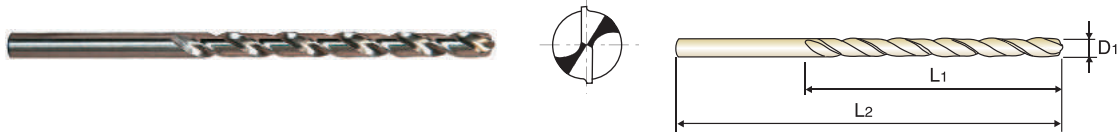
## HSSCo8, STRAIGHT SHANK TWIST DRILLS

► **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  
340HSS  
Co8N  
33°

h8

135°



Ölçü : mm

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy	
	D1	L1	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	Kesme Kenarı Boyu	Tam Boy	
	D1	L1	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

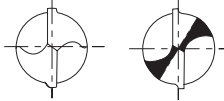
N= Devir  
S= Devir başına ilerleme (mm/ devir)

## HSS-E SİLİNDİRİK SAPLI, KAPLAMALI MATKAP UCU

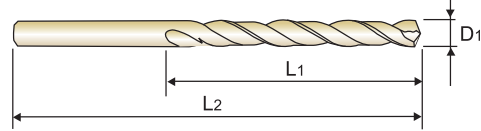
### HSS-E STRAIGHT SHANK DRILLS, COATED

- **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	Kesme Kenarı Boyu	Tam Boy
	D1	L1	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	Kesme Kenarı Boyu	Tam Boy
	D1	L1	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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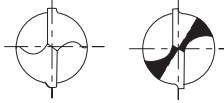
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~								
◎	◎					○	○	○	○			

## HSS-E SİLİNDİRİK SAPLI, KAPLAMALI MATKAP UCU

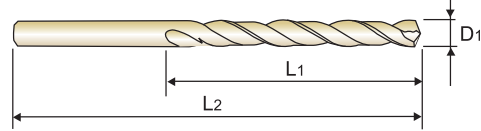
### HSS-E STRAIGHT SHANK DRILLS, COATED

- **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	Kesme Kenarı Boyu	Tam Boy
	D1	L1	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	Kesme Kenarı Boyu	Tam Boy
	D1	L1	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

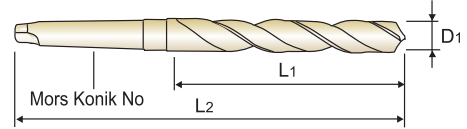
N= Devir  
S= Devir başına ilerleme (mm/ devir)

## HSS, MORS KONİK SAPLI MATKAP UCU

### HSS, MORSE TAPER SHANK TWIST DRILLS

- **Yüzeysel Uygulaması:** Buhar Menevişli (Siyah oksitli son yüzey)
- **Kullanım Yerleri :** Çelik , alaşımlı ve alaşımsız çelik döküm gri dökme demir, dövülebilir dökme demir ve grafit

- **Surface treatment :** Steam Tempered (Black Oxide Finish)
- **Application :** Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron, graphite.



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2	Mors Konik No.
PMA-3070	7.0	69	150	1
PMA-3075	7.5	69	150	1
PMA-3080	8.0	75	156	1
PMA-3085	8.5	75	156	1
PMA-3090	9.0	81	162	1
PMA-3100	10.0	87	168	1
PMA-3110	11.0	94	175	1
PMA-3120	12.0	101	175	1
PMA-3130	13.0	101	182	1
PMA-3135	13.5	108	189	1
PMA-3140	14.0	108	189	1
PMA-3145	14.5	114	212	2
PMA-3150	15.0	114	212	2
PMA-3155	15.5	120	218	2
PMA-3160	16.0	120	218	2
PMA-3165	16.5	125	223	2
PMA-3170	17.0	125	223	2
PMA-3175	17.5	130	228	2
PMA-3180	18.0	130	228	2
PMA-3185	18.5	135	233	2
PMA-3190	19.0	135	233	2
PMA-3195	19.5	140	238	2
PMA-3200	20.0	140	238	2
PMA-3205	20.5	145	243	2
PMA-3210	21.0	145	243	2
PMA-3215	21.5	150	248	2
PMA-3220	22.0	150	248	2
PMA-3225	22.5	155	253	2
PMA-3230	23.0	155	253	2
PMA-3235	23.5	160	276	3
PMA-3240	24.0	160	281	3

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2	Mors Konik No.
PMA-3245	24.5	160	281	3
PMA-3250	25.0	160	281	3
PMA-3255	25.5	165	286	3
PMA-3260	26.0	165	286	3
PMA-3265	26.5	165	286	3
PMA-3270	27.0	170	291	3
PMA-3275	27.5	170	291	3
PMA-3280	28.0	170	291	3
PMA-3285	28.5	175	296	3
PMA-3290	29.0	175	296	3
PMA-3295	29.5	175	296	3
PMA-3300	30.0	175	296	3
PMA-3305	30.5	180	301	3
PMA-3310	31.0	180	301	3
PMA-3315	31.5	180	301	3
PMA-3320	32.0	185	334	3
PMA-3330	33.0	185	334	4
PMA-3335	33.5	185	334	4
PMA-3340	34.0	190	339	4
PMA-3345	34.5	190	339	4
PMA-3350	35.0	190	339	4
PMA-3355	35.5	190	339	4
PMA-3360	36.0	195	344	4
PMA-3365	36.5	195	344	4
PMA-3370	37.0	195	344	4
PMA-3375	37.5	195	344	4
PMA-3380	38.0	200	349	4
PMA-3385	38.5	200	349	4
PMA-3390	39.0	200	349	4
PMA-3395	39.5	200	349	4
PMA-3400	40.0	200	349	4

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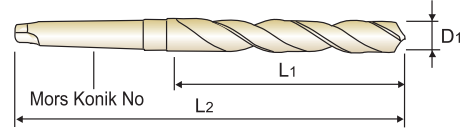
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~								
◎	◎	○			○	○	○		○			

## HSS, MORS KONİK SAPLI MATKAP UCU

### HSS, MORSE TAPER SHANK TWIST DRILLS

- **Yüzeysel Uygulaması:** Buhar Menevişli (Siyah oksitli son yüzey)
- **Kullanım Yerleri :** Çelik , alaşımlı ve alaşımsız çelik döküm gri dökme demir, dövülebilir dökme demir ve grafit

- **Surface treatment :** Steam Tempered (Black Oxide Finish)
- **Application :** Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron, graphite.



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2	Mors Konik No.
PMA-3405	40.5	205	354	4
PMA-3410	41.0	205	354	4
PMA-3415	41.5	205	354	4
PMA-3420	42.0	205	354	4
PMA-3425	42.5	205	354	4
PMA-3430	43.0	210	359	4
PMA-3435	43.5	210	359	4
PMA-3440	44.0	210	359	4
PMA-3445	44.5	210	359	4
PMA-3450	45.0	210	359	4
PMA-3455	45.5	215	364	4
PMA-3460	46.0	215	364	4
PMA-3465	46.5	215	364	4
PMA-3470	47.0	215	364	4
PMA-3475	47.5	215	364	4
PMA-3480	48.0	220	369	4

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2	Mors Konik No.
PMA-3485	48.5	220	369	4
PMA-3490	49.0	220	369	4
PMA-3495	49.5	220	369	4
PMA-3500	50.0	220	369	4
PMA-3505	50.5	225	374	4
PMA-3510	51.0	225	412	5
PMA-3520	52.0	225	412	5
PMA-3530	53.0	225	412	5
PMA-3540	54.0	230	417	5
PMA-3550	55.0	230	417	5
PMA-3560	60.0	230	417	5
PMA-3570	57.0	235	422	5
PMA-3580	58.0	235	422	5
PMA-3590	59.0	235	422	5
PMA-3600	60.0	235	422	5

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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~								
◎	◎	○			○	○	○		○			

PRO-X

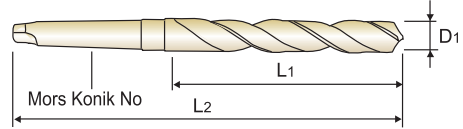
MATKAPLAR  
DRILLS

## HSS, UZUN MORS KONİK MATKAP UCU

### HSS, MORSE TAPER SHANK TWIST DRILLS

- **YüzeY Uygulaması:** Buhar Menevişli (Siyah oksitli son yüzeY)
- **Kullanım Yerleri :** Çeliklerin derin delikleri, alaşımli ve alaşım-sız dökme çelik, gri dökme demir, dövülebilir dökme demir, grafit

- **Surface treatment :** Steam Tempered (Black Oxide Finish)
- **Application :** Drilling deep holes in steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron, graphite.



Ölçü : mm

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2	Mors Konik No.
PMA-4130	13.0	134	215	1
PMA-4135	13.5	142	223	1
PMA-4140	14.0	142	223	1
PMA-4145	14.5	142	245	2
PMA-4150	15.0	147	245	2
PMA-4155	15.5	153	251	2
PMA-4160	16.0	153	251	2
PMA-4165	16.5	159	257	2
PMA-4170	17.0	159	257	2
PMA-4175	17.5	165	263	2
PMA-4180	18.0	165	263	2
PMA-4185	18.5	171	269	2
PMA-4190	19.0	171	269	2

KOD	Matkap Çapı D1	Kesme Kenarı Boyu L1	Tam Boy L2	Mors Konik No.
PMA-4195	19.5	177	275	2
PMA-4200	20.0	177	275	2
PMA-4210	21.0	184	282	2
PMA-4220	22.0	191	289	2
PMA-4230	23.0	198	296	2
PMA-4240	24.0	206	327	3
PMA-4250	25.0	206	327	3
PMA-4260	26.0	214	335	3
PMA-4270	27.0	222	343	3
PMA-4280	28.0	222	343	3
PMA-4290	29.0	230	351	3
PMA-4300	30.0	230	351	3

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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- 3000 / 4000 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
13.0	645	0.17	480	0.17	370	0.09	440	0.17	265	0.05	480	0.17	265	0.09
19.0	440	0.23	330	0.23	255	0.13	300	0.23	180	0.05	330	0.23	180	0.13
32.0	260	0.28	195	0.28	145	0.18	180	0.28	107	0.08	195	0.28	107	0.18
50.0	165	0.33	125	0.33	93	0.20	115	0.33	68	0.08	125	0.33	68	0.20
60.0	140	0.40	105	0.40	78	0.23	95	0.40	57	0.10	105	0.40	57	0.23

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
13.0	645	0.17	480	0.17	1200	0.26	1600	0.26	1200	0.26	645	0.17
19.0	440	0.23	330	0.23	820	0.30	1100	0.30	820	0.30	440	0.23
32.0	240	0.30	195	0.28	490	0.38	660	0.38	490	0.38	260	0.28
50.0	150	0.43	125	0.33	310	0.46	415	0.46	310	0.46	165	0.33
60.0	125	0.48	105	0.40	260	0.50	345	0.50	260	0.50	140	0.40

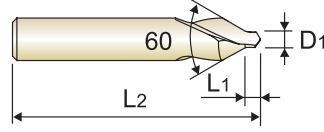
N= Devir  
S= Devir başına ilerleme (mm/ devir)

HSS, FORM A PUNTA MATKABI

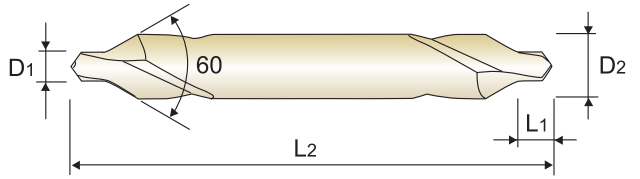
HSS, CENTER DRILLS FORM A



Form A  
(D1303, Ø0.5, Ø0.8)



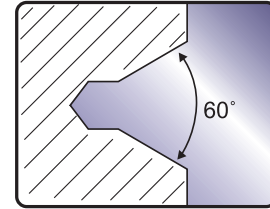
Form A (D1303)



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/mm2		~ 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

**PRO-X** MATKAPLAR  
DRILLS

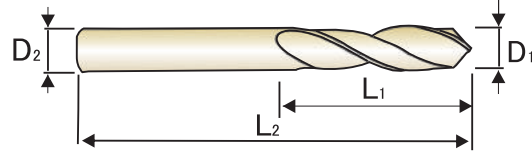
**KARBÜR MATKAPLAR**  
**CARBIDE DRILLS**

► **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	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	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	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	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~								
◎	◎				○	○	○	○	○			



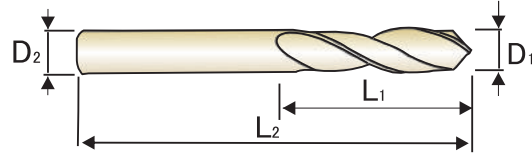
## KARBÜR MATKAPLAR CARBIDE DRILLS

► **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	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	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	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	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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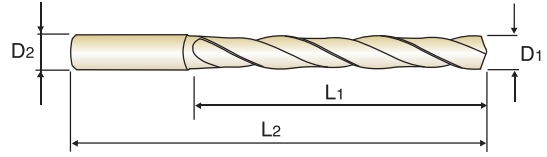
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~								
©	©				○	○	○	○	○			

**PRO-X** MATKAPLAR  
DRILLS

**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.



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

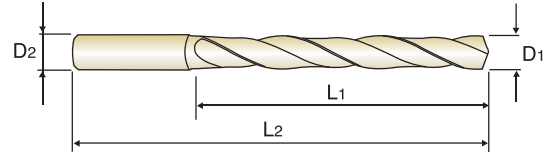
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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze	CFRP
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~								
◎	◎				○	○	○	○	○			

## 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.



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~								
◎	◎				○	○	○	○	○			

**PRO-X** MATKAPLAR  
DRILLS

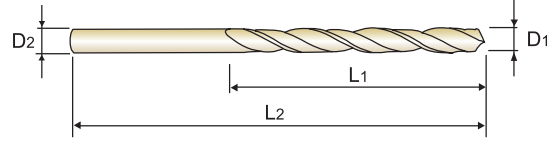
**KARBÜR MATKAPLAR**  
**CARBIDE DRILLS**

► **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	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	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-6028	2.8	33	61
PMA-6030	3.0	33	61
PMA-6031	3.1	36	65

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	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~								
◎	◎				○	○	○	○	○			

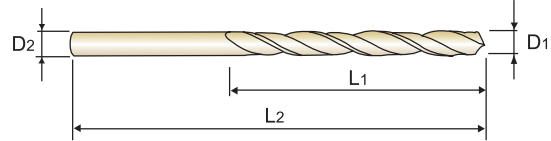
## KARBÜR MATKAPLAR CARBIDE DRILLS

► **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<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-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
F'MA-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-6068	6,8	69	109

KOD	Matkap Çapı	Kesme Kenarı Boyu	Tam Boy
	D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>
PMA-6070	7,0	69	109
PMA-6075	7,5	69	109
PMA-6080	8,0	75	117
PMA-6085	8,5	75	117
PMA-6090	9,0	81	125
PMA-6095	9,5	81	125
PMA-6100	10,0	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-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, Si<10%		AL-Sİ ALAŞIMLARI, Si>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 arttırılabilir.

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

**PRO-X**

KILAVUZLAR  
TAPS  
2

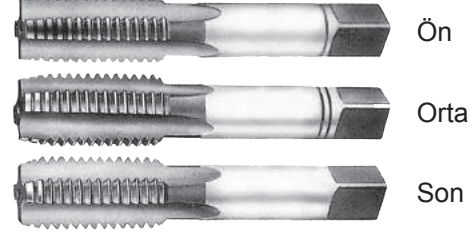
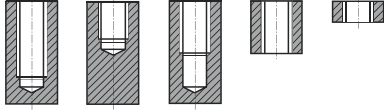
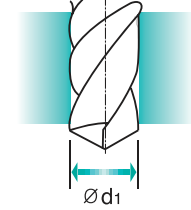
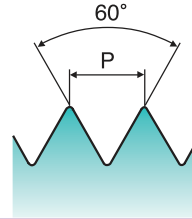
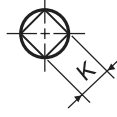
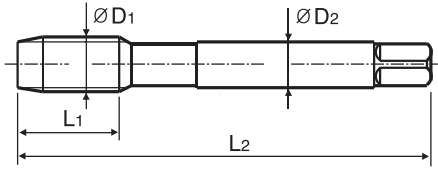


2

**KILAVUZLAR  
TAPS**

**PRO-X****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****HSS****DIN  
352****6H****Parlak****Kılavuz Seti  
Sets of taps**

Ölçü : mm

ÖLÇÜ	Adım		KOD	Diş	Tam	Şaft	Dört Köşe	Kılavuz Matkap	
	D <sub>1</sub>	P		Boyu	Boy	Çapı	Ölçüsü	Çapı	
				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	

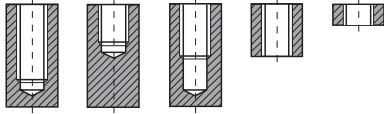


DÜZ MAKİNE KILAVUZU - DIN 371 HSS-E  
STRAIGHT FLUTE TAPS - DIN 371 HSS-E

► Çelik ve dökme demirin işlenmesi için uygundur.

► Suitable for tapping cast iron or similar work materials.

Delik Tipi



HSS-E

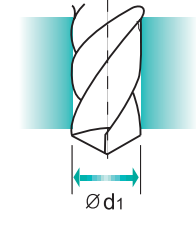
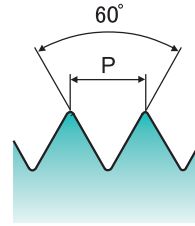
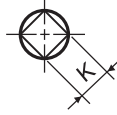
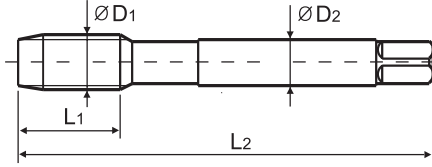
DIN  
371/376

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	× 0.4	PKI-2M2	8	45	2.8	2.1	1.6	
M2.2	× 0.45	PKI-2M2N2	8	45	2.8	2.1	1.75	
M2.3	× 0.4	PKI-2M2N3	8	45	2.8	2.1	1.9	
M2.5	× 0.45	PKI-2M2N5	9	50	2.8	2.1	2.05	
M2.6	× 0.45	PKI-2M2N6	9	50	2.8	2.1	2.1	
M3	× 0.5	PKI-2M3	11	56	3.5	2.7	2.5	
M3.5	× 0.6	PKI-2M3N5	12	56	4	3	2.9	
M4	× 0.7	PKI-2M4	13	63	4.5	3.4	3.3	
M4.5	× 0.75	PKI-2M4N5	14	70	6	4.9	3.7	
M5	× 0.8	PKI-2M5	15	70	6	4.9	4.2	
M6	× 1	PKI-2M6	17	80	6	4.9	5	
M7	× 1	PKI-2M7	17	80	7	5.5	6	
M8	× 1.25	PKI-2M8	20	90	8	6.2	6.8	
M9	× 1.25	PKI-2M9	20	90	9	7	7.8	
M10	× 1.5	PKI-2M10	22	100	10	8	8.5	
M11	× 1.5	PKI-2M11	22	100	8	6.2	9.5	
M12	× 1.75	PKI-2M12	24	110	9	7	10.2	
M14	× 2	PKI-2M14	26	110	11	9	12	
M16	× 2	PKI-2M16	27	110	12	9	14	
M18	× 2.5	PKI-2M18	30	125	14	11	15.5	
M20	× 2.5	PKI-2M20	32	140	16	12	17.5	
M22	× 2.5	PKI-2M22	32	140	18	14.5	19.5	
M24	× 3	PKI-2M24	34	160	18	14.5	21	
M27	× 3	PKI-2M27	36	160	20	16	24	
M30	× 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
					◎									◎

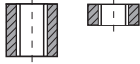
DÜZ MAKİNE KILAVUZU DIN 371 HSS-E (Çok Amaçlı Seri)

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



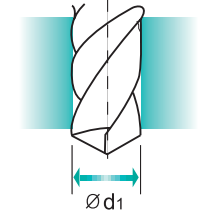
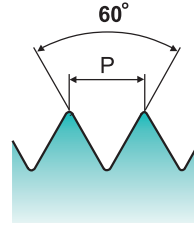
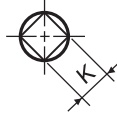
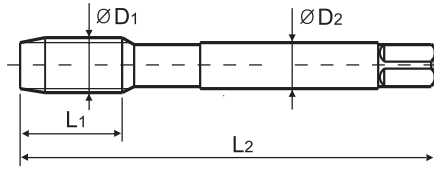
HSS-E

DIN 371/376

6H



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	× 0.4	PKI-2M2C	8	45	2.8	2.1	1.6	
M3	× 0.5	PKI-2M3C	11	56	3.5	2.7	2.5	
M4	× 0.7	PKI-2M4C	13	63	4.5	3.4	3.3	
M5	× 0.8	PKI-2M5C	15	70	6	4.9	4.2	
M6	× 1.0	PKI-2M6C	17	80	6	4.9	5	
M8	× 1.25	PKI-2M8C	20	90	8	6.2	6.8	
M10	× 1.5	PKI-2M10C	22	100	10	8	8.5	
M12	× 1.75	PKI-2M12C	24	110	9	7	10.2	
M14	× 2.0	PKI-2M14C	26	110	11	9	12	
M16	× 2.0	PKI-2M16C	27	110	12	9	14	
M18	× 2.5	PKI-2M18C	30	125	14	11	15.5	
M20	× 2.5	PKI-2M20C	32	140	16	12	17.5	
M22	× 2.5	PKI-2M22C	32	140	18	14.5	18.5	
M24	× 3.0	PKI-2M24C	34	160	18	14.5	21	

◎:Mükemmel ○:iyi

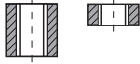
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	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 37 4 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



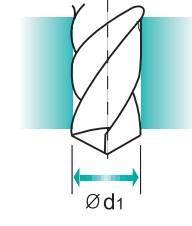
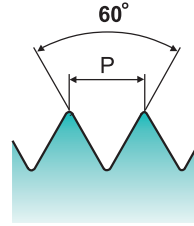
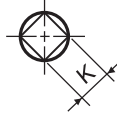
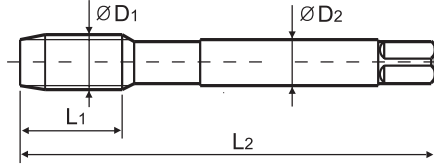
HSS-E

DIN 374

6H



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	× 0,5	PKI-2M4CF	10	63	2,8	2,1	3,5	
M5	× 0,5	PKI-2M5CF	11	70	3,5	2,7	4,5	
M6	× 0,75	PKI-2M6N75CF	13	80	4,5	3,4	5,2	
M6	× 0,5	PKI-2M6N5CF	13	80	4,5	3,4	5,5	
M8	× 1,0	PKI-2M8CF	17	90	6	4,9	7	
M10	× 1,25	PKI-2M10N25CF	22	100	7	5,5	8,8	
M10	× 1,0	PKI-2M10CF	18	90	7	5,5	9	
M12	× 1,5	PKI-2M12N5CF	22	100	9	7	10,8	
M12	× 1,0	PKI-2M12CF	18	100	9	7	11	
M14	× 1,5	PKI-2M14N5CF	22	100	11	9	12,5	
M14	× 1,25	PKI-2M14N25CF	22	100	11	9	12,8	
M14	× 1 0	PKI-2M14CF	18	100	11	9	13	
M16	× 1,5	PKI-2M16N5CF	15	100	12	9	14,5	
M16	× 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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

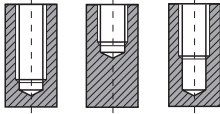
HELİS MAKİNE KILAVUZU - DIN 371 HSS-E

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 flute geometry and excellent chip evacuation.

Delik Tipi



DIN 371

DIN 376

HSS-E

DIN  
371/376

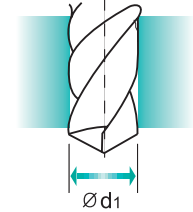
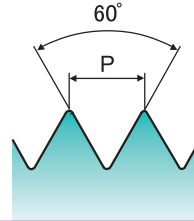
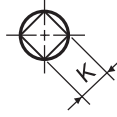
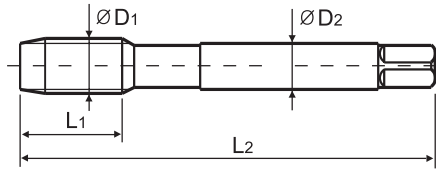
6H



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	× 0.4	PKI-3M2	8	45	2.8	2.1	1.6	
M2.2	× 0.45	PKI-3M2N2	8	45	2.8	2.1	1.75	
M2.3	× 0.4	PKI-3M2N3	8	45	2.8	2.1	1.9	
M2.5	× 0.45	PKI-3M2N5	9	50	2.8	2.1	2.05	
M2.6	× 0.45	PKI-3M2N6	9	50	2.8	2.1	2.1	
M3	× 0.5	PKI-3M3	6	56	3.5	2.7	2.5	
M3.5	× 0.6	PKI-3M3N5	7	56	4	3	2.9	
M4	× 0.7	PKI-3M4	7	63	4.5	3.4	3.3	
M4.5	× 0.75	PKI-3M4N5	8	70	6	4.9	3.7	
M5	× 0.8	PKI-3M5	8	70	6	4.9	4.2	
M6	× 1	PKI-3M6	10	80	6	4.9	5	
M7	× 1	PKI-3M7	10	80	7	5.5	6	
M8	× 1.25	PKI-3M8	13	90	8	6.2	6.8	
M9	× 1.25	PKI-3M9	13	90	9	7	7.8	
M10	× 1.5	PKI-3M10	15	100	10	8	8.5	
M11	× 1.5	PKI-3M11	17	100	8	6.2	9.5	
M12	× 1.75	PKI-3M12	18	110	9	7	10.2	
M14	× 2	PKI-3M14	20	110	11	9	12	
M16	× 2	PKI-3M16	20	110	12	9	14	
M18	× 2.5	PKI-3M18	25	125	14	11	15.5	
M20	× 2.5	PKI-3M20	25	140	16	12	17.5	
M22	× 2.5	PKI-3M22	25	140	18	14.5	19.5	
M24	× 3	PKI-3M24	30	160	18	14.5	21	
M27	× 3	PKI-3M27	30	160	20	16	24	
M30	× 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
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

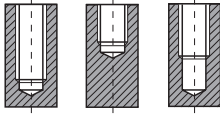
HELİS MAKİNE KILAVUZU DIN 371 HSS-E (Çok Amaçlı Seri)

SPİRAL 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 flute geometry and excellent chip evacuation.
- Coating is available on request

Delik Tipi



DIN 371

HSS-E

DIN  
371/376

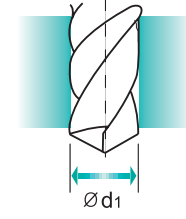
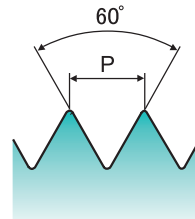
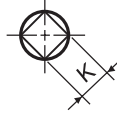
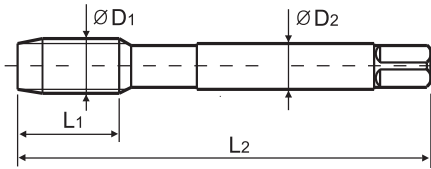
6H



BRIGHT  
TiN

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>	
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 ○:iyi

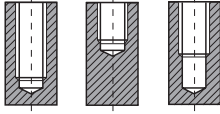
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy < 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	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
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

## 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



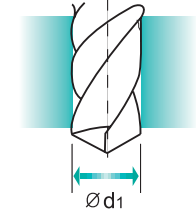
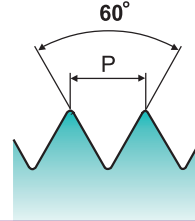
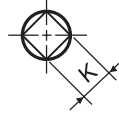
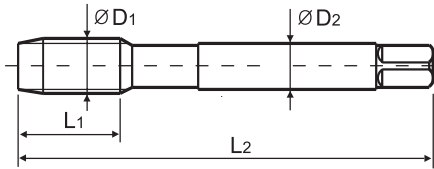
HSS-E

DIN  
374

6H



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	10,8	
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 ○:iyi

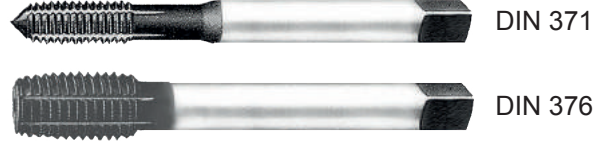
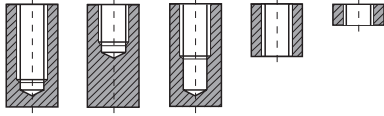
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

## 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.

Delik Tipi



HSS-E

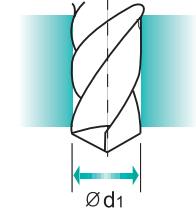
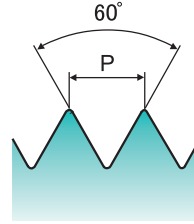
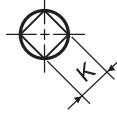
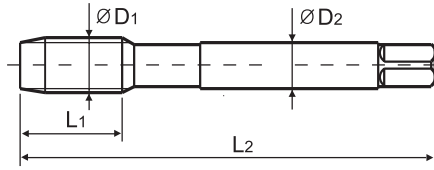
DIN  
371/376

6HX



NI

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
	○			○		○		○		○				

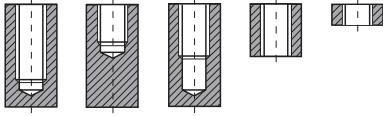
**PRO-X****KILAVUZLAR  
TAPS****İNCE DİŞ OVALAMA KILAVUZU - YAĞ KANALLI  
COLD FORM TAP - OIL GROOVE**

► Çelik ve dökme demirin işlenmesi için uygundur.

► Suitable for tapping cast iron or similar work materials.

KILAVUZLAR  
TAPS  
2

Delik Tipi



DIN 374

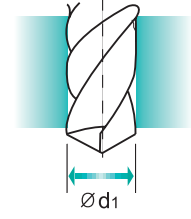
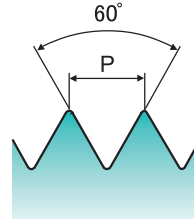
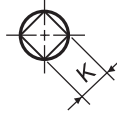
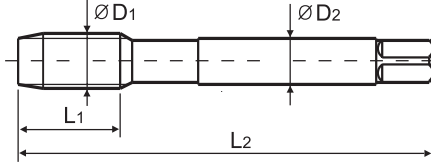
HSS-E

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	× 0.5	PKI-4M4F	10	63	2.8	2.1	3.75	
M5	× 0.5	PKI-4M5F	11	70	3.5	2.7	4.75	
M6	× 0.75	PKI-4M6F	13	80	4.5	3.4	5.65	
M6	× 0.5	PKI-4M6F1	13	80	4.5	3.4	5.75	
M8	× 1	PKI-4M8F	17	90	6	4.9	7.50	
M8	× 0.75	PKI-4M8F1	14	80	6	4.9	7.65	
M10	× 1.25	PKI-4M10F	22	100	7	5.5	9.4	
M10	× 1	PKI-4M10F1	18	90	7	5.5	9.5	
M10	× 0.75	PKI-4M10F5	18	90	7	5.5	9.65	
M12	× 1.5	PKI-4M12F	22	100	9	7	11.25	
M12	× 1.25	PKI-4M12F1	22	100	9	7	11.4	
M12	× 1	PKI-4M12F5	18	100	9	7	11.5	
M14	× 1.5	PKI-4M14F	22	100	11	9	13.25	
M16	× 1.5	PKI-4M16F1	22	100	12	9	15.25	

©: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
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

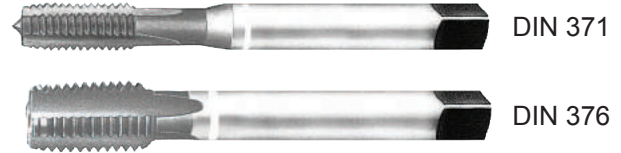
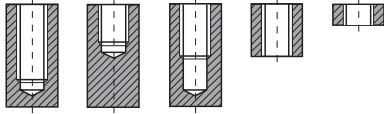


KARBÜR DÜZ KILAVUZ  
CARBIDE TAP STRAIGHT

► Çelik ve dökme demirin işlenmesi için uygundur.

► Suitable for tapping cast iron or similar work materials.

Delik Tipi



HM

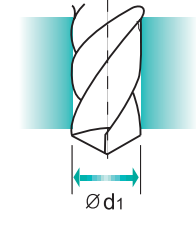
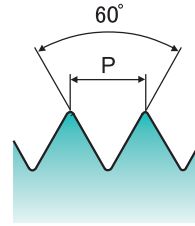
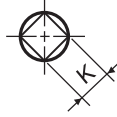
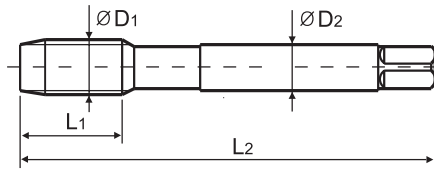
DIN  
371/376

6HX



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>	
M3	× 0.5	PKI-5M3	11	56	3.5	2.7	2.5	
M4	× 0.7	PKI-5M4	13	63	4.5	3.4	3.3	
M5	× 0.8	PKI-5M5	15	70	6	4.9	4.2	
M6	× 1	PKI-5M6	17	80	6	4.9	5	
M8	× 1.25	PKI-5M8	20	90	8	6.2	6.8	
M10	× 1.5	PKI-5M10	22	100	10	8	8.5	
M12	× 1.75	PKI-5M12	24	110	9	7	10.2	

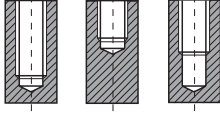
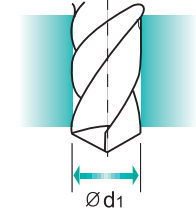
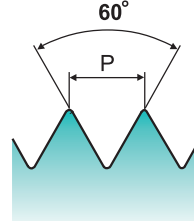
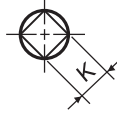
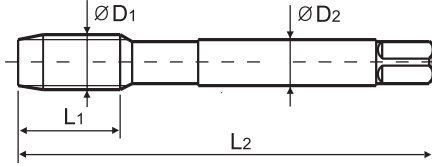
©:Mükemmel ○:İyi

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
					○						○			○

**PRO-X****KILAVUZLAR  
TAPS****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****HSS-E****DIN  
371/376****2B****60°****C****BRIGHT  
TiN****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>	
#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 ○: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
					○									○

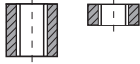
## UNC DÜZ KILAVUZ (Çok Amaçlı Seri)

### 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



HSS-E

DIN 371/376

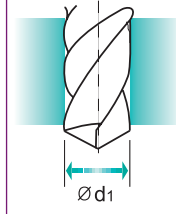
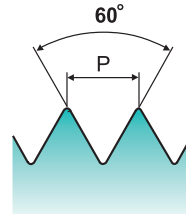
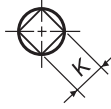
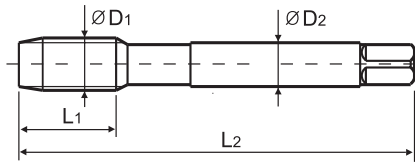
2B

60°

B

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	- 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	

◎:Mükemmel ○:İyi

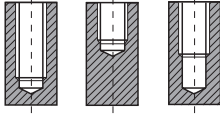
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy ≤ 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	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 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



HSS-E

DIN  
371/374

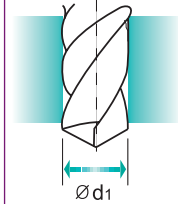
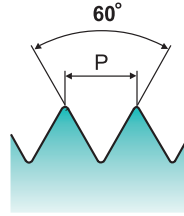
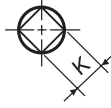
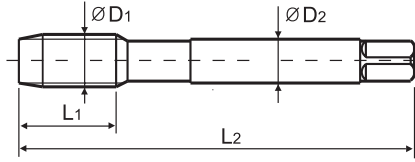
2B



Bright  
TiN

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>	
#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 ○: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
					◎									◎

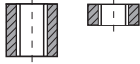
## UNF DÜZ KILAVUZ (Çok Amaçlı Seri)

### 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

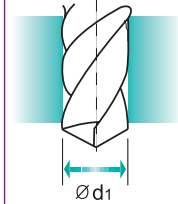
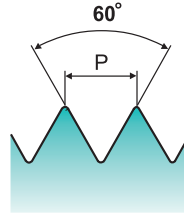
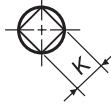
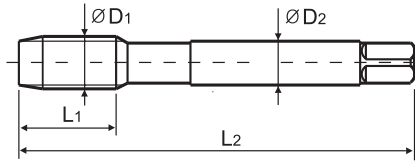
DIN 371/374

2B



Bright  
TiN

Makine Kılavuzu  
Machine taps



Ölçü : mm

ÖLÇÜ	Adım	KOD	Diş Boyu	Tam Boy	Şaft Çapı	Dört Köşe Ölçüsü	Kılavuz Matkap Çapı	
D1	P		L1	L2	D2	K	d1	
#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	

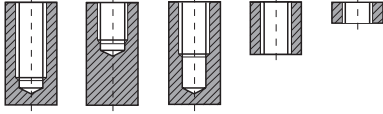
◎:Mükemmel ○:İyi

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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

**PRO-X****KILAVUZLAR  
TAPS****WITHWORTH BORU DIŐ BSP EI KILAVUZU - DIN5157 / HSS****WITHWORTH PIPE THREADS - DIN5157 / HSS**

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

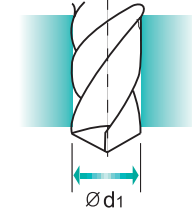
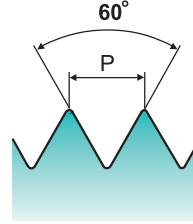
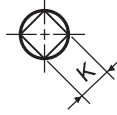
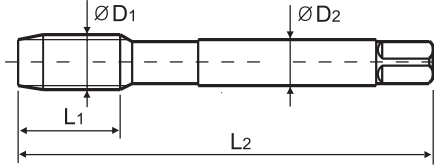
► Serial hand tap set in First and Bottoming. Bottoming tap of set has final internal thread dimensions only.

**Delik Tipi**

İlk



Son

**HSS****DIN  
5157****55°****I/III****Parlak****Makine Kılavuzu  
Machine taps**

Ölçü : mm

ÖLÇÜ	Adım	KOD	Diő Boyu	Tam Boy	Őaft Çapı	Dört Köőe 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	

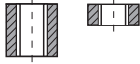
WITHWORTH BSP BORU DIŞ DÜZ KILAVUZ DIN5156 / HSS-E

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

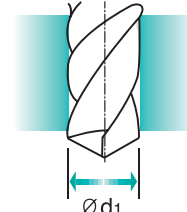
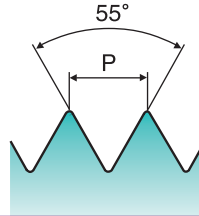
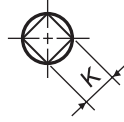
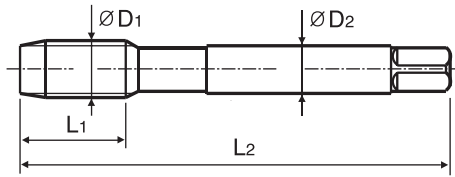
DIN 5156

55°

B

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 ○:İyi

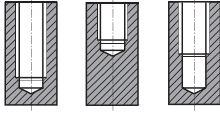
Steel < 400	Steel < 700	Steel < 850	St. Alloy < 850	St. Alloy < 1200	St. Alloy > 1200	INOX Free < 850	INOX Aust. < 850	INOX < 1000	GG Cast < 500	GG Cast < 1000	GGG Cast < 700	GGG Cast < 1000	Ti < 700	Ti Alloy < 900
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ti Alloy ≤ 1300	Ni < 500	Ni Alloy < 900	Ni Alloy ≤ 1400	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
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

**PRO-X****KILAVUZLAR  
TAPS****WITHWORTH 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

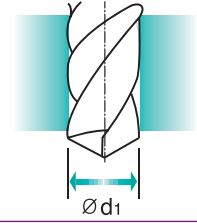
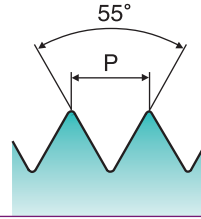
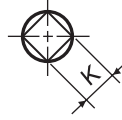
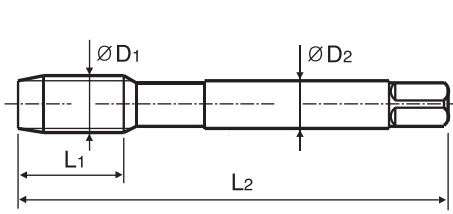
DIN  
5156

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	

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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
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



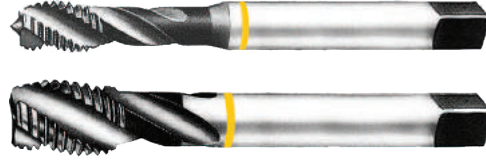
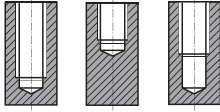
WITHWORTH BSW HELİSEL KILAVUZ DIN2182

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

HSS-E

DIN  
2182/2183

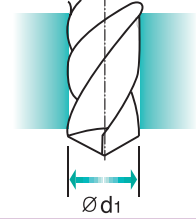
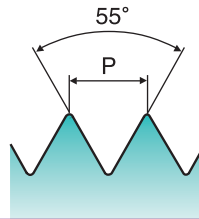
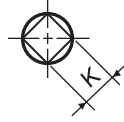
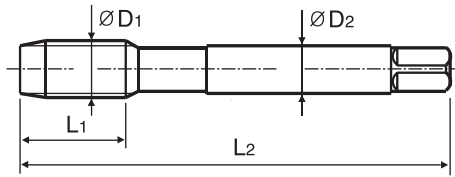
55°

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>	
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-93789	27	140	18	14.5	19.25	
W1"	- 8	PKI-9318	30	160	20	16	22	

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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
					○	○					○			



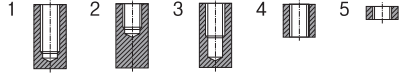
## MAKİNA KILAVUZLARI

### ÖNERİ TABLOSU

### KULLANABİLİRLİK

⊙ = MÜKEMMEL

○ = İYİ

















MALZEME GRUPLARI			MU	MU		
DIN 371/376	M	Ürün Kodu	PKI-3MC			
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				
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	Bright		
HELİS AÇISI			R40	R40		
GİRİŞ AÇISI			C	C		
DELİK TİPİ			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

	MALZEME GRUPLARI		MALZEME GRUPLARI		SERTLİK	KOPMA MUKAVEMETİ	TALAŞ TİPİ	KESME HIZI	SOĞUTMA TİPİ		
	HB	Rm N/mm2	Vc m/min								
<b>10. ÇELİK</b>	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	⊙	⊙	
<b>20. PASLANMAZ ÇELİK</b>	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	⊙	⊙	
<b>30. DÖKME DEMİR</b>	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	⊙	⊙	
<b>40. TİTANYUM</b>	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	○	○	
<b>50. NİKEL</b>	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	○	○	
<b>60. BAKIR, PİRİNÇ, BRONZ</b>	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			
<b>70. ALÜMİNYUM</b>	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	⊙	⊙	
<b>80. PLASTİK</b>	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	GS	GS	GS	GS	GV	GV	GG	GG
			PKI-2MC							PKI-3M	PKI-4M		PKI-2M	PKI-5M
						PKI-2MCF						PKI-4MF		
	PKI-73					PKI-72								
		PKI-83				PKI-82								
								PKI-93						
							PKI-92		PKI-93					
	Bright	Bright	Bright	Bright	Bright	Bright	Bright	Bright	Bright	TiN	NI	NI	TiN	Bright
	R40	R40						R40	R40	R40				
	C	C	B	B	B	B	B	C	C	C	C	C	C	C
	1-2-3	1-2-3	4-5	4-5	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**

3  
PARMAK FREZELER  
END MILLS

# 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

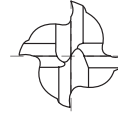
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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRc40~45	HRc45~55	HRC55~70									
◎	◎	◎				○		○	○	○	○	○		

**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 mill.
- 4 flute allows for better work piece finishes.



3  
PARMAK FREZELER  
END MILLS

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

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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 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 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	Comer Radius R	Freze Çapı	Şaft Çapı	Kesme Kenar 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	10,0	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	

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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 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 mill.
- 4 flute allows for better work piece finishes.



Ölçü : mm

KOD	Comer Radius R	Freze Çapı	Şaft Çapı	Kesme Kenar 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	12.0	12	24	100	
PPF-14100-1RL	R1.0	12.0	12	24	100	
PPF-14120-05RL	R1.5	12.0	12	24	100	
PPF-14120-1RL	R2.0	12.0	12	24	100	

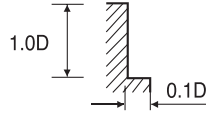
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Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRc40~45	HRc45~55	HRC55~70									
◎	◎	◎				○		○	○	○	○	○		

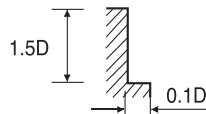
TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS

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				ALUMİNYUMLU 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

**PRO-X****PARMAK FREZELER  
END MILLS****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 kontur işleme için dizayn edilmiştir.

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



Ölçü : mm

KOD	Comer Radius	Freze Çapı	Şaft Çapı	Kesme Kenar Boyu	Tam Boy	
	R (±0.02)					
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

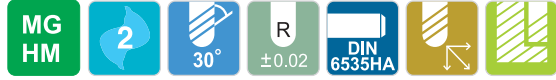
©:Mükemmel ○:iyi

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									
◎	◎	◎	○			○		○	○	○	○	○		

**PRO-X****PARMAK FREZELER  
END MILLS****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 kontur işleme için dizayn edilmiştir.

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



Ölçü : mm

KOD	Comer Radius	Freze Çapı	Şaft Çapı	Kesme Kenar Boyu	Tam Boy	
	R (±0.02)					
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

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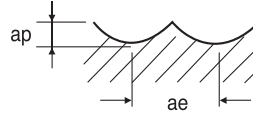
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70									
◎	◎	◎	○			○		○	○	○	○	○		

**TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS**

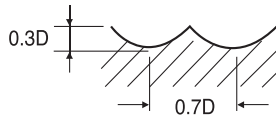
**PPF - 22 SERİSİ**

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



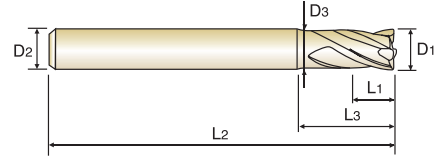
\* İlerleme L & EX kodlu uzun frezelerde %50 oranında azaltılmalıdır.

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

**PRO-X****PARMAK FREZELER  
END MILLS****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

**NG  
HM****4****BLUE****30°****PLAIN**

P.699

Ölçü : mm

KOD	Freze Çapı	Şaft Çapı	Kesme Kenarı Boyu	Arka Boyun Çapı	Tam Boy	Boyun Çapı	
	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-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-414160	16.0	16	16	32	90	15.7	

Boy	Freze Çapı Toleransı (mm)	Boyun Çapı Toleransı
ø6'ya kadar	0~-0.012	h6
ø6 sonrası	0~-0.015	

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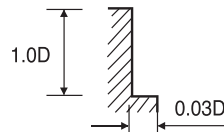
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels	High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45 HRC45~55	HRC55~70									
		○	○	◎									

**TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS**

**PPF- 414 serisi**

MALZEME	ALAŞIMLI ÇELİKLER ISI DAYANIMLI ÇELİKLER				SERTLEŞTİRİLMİŞ ÇELİKLER								
	HRc 30 ~ HRc 40				HRc 40 ~ HRc 50				HRc 50 ~ HRc 55				
SERTLİK	ÇAP	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	ÇAP	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	

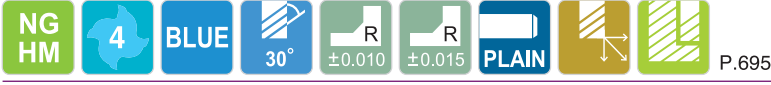


DEVİR = dev/dak  
İLERLEME = mm/dak  
Vc = m/dak  
fz = mm/ağız

**PRO-X****PARMAK FREZELER  
END MILLS****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 kesimde çalışmaya 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 Kenar 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	

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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									
		○	○	◎									

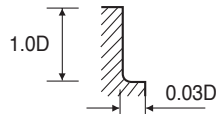


**TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS**

**PPF - 414 (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

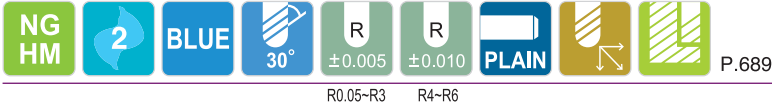
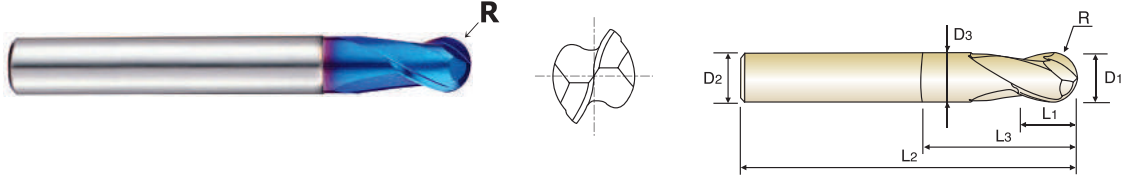


DEVİR = dev/dak  
İLERLEME = mm/dak  
Vc = m/dak  
fz = mm/ağız

**PRO-X****PARMAK FREZELER  
END MILLS****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	

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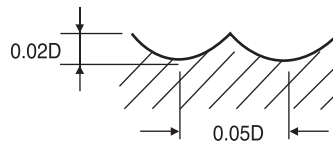
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels	High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRc40~45 HRc45~55	HRC55~70									
		○	○	◎									

**TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS**

**PPF- 422 serisi**

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

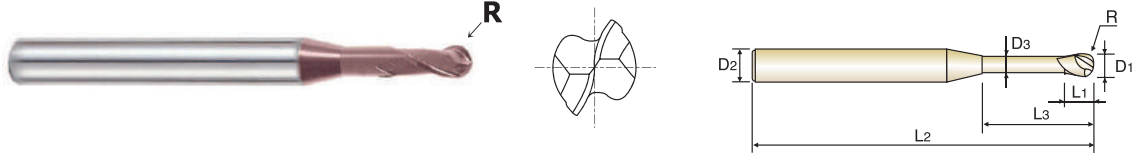


RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz = mm/t

**PRO-X****PARMAK FREZELER  
END MILLS****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.



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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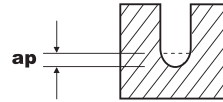
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels	High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRc40~45 HRc45~55	HRC55~70									
◎	◎	◎			○		○	○	○				

TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS

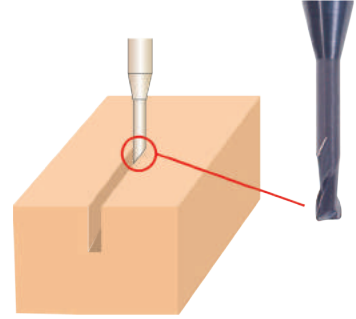
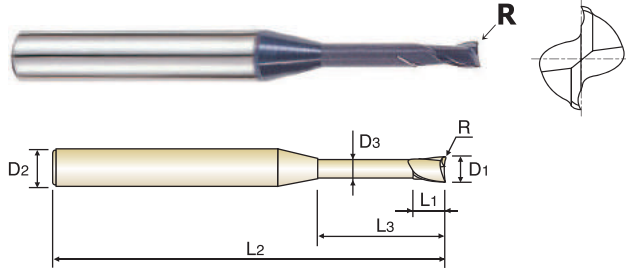
## PPF- 322 SERİSİ

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**PARMAK FREZELER  
END MILLS

3

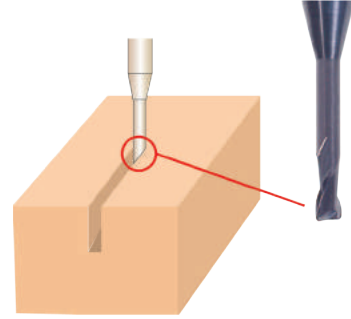
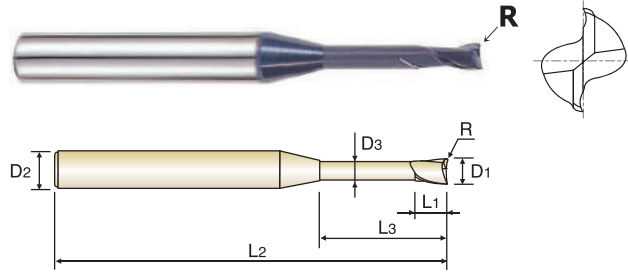


Ölçü : mm

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	12	45	1.95	
PPF-31220-12L	RO.02	2.0	4	3	18	55	1.95	
PPF-31220-16L	RO.02	2.0	4	3	20	55	1.95	
PPF-31220-20L	RO.02	2.5	4	3.7	8	45	2.40	
PPF-31225-8L	RO.02	2.5	4	3.7	10	45	2.40	
PPF-31225	RO.02	2.5	4	3.7	16	55	2.40	
PPF-31225-16L	RO.03	3.0	6	4.5	8	45	2.85	
PPF-31230	RO.03	3.0	6	4.5	10	45	2.85	
PPF-31230-10L	RO.03	3.0	6	4.5	12	45	2.85	
PPF-31230-12L	RO.03	3.0	6	4.5	14	50	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	30	70	2.85	
PPF-31230-30L	RO.03	3.0	6	4.5	40	90	2.85	
PPF-31230-40L	RO.03	4.0	6	6	12	50	3.85	
PPF-31240-16L	RO.03	4.0	6	6	16	60	3.85	
PPF-31240-20L	RO.03	4.0	6	6	20	60	3.85	
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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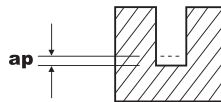
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRc40~45	HRc45~55	HRC55~70									
○	◎	◎	◎	○				○						

TAVSİYE EDİLEN KESME DEĞERLERİ  
RECOMMENDED CUTTING CONDITIONS

PPF- 312 serisi

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



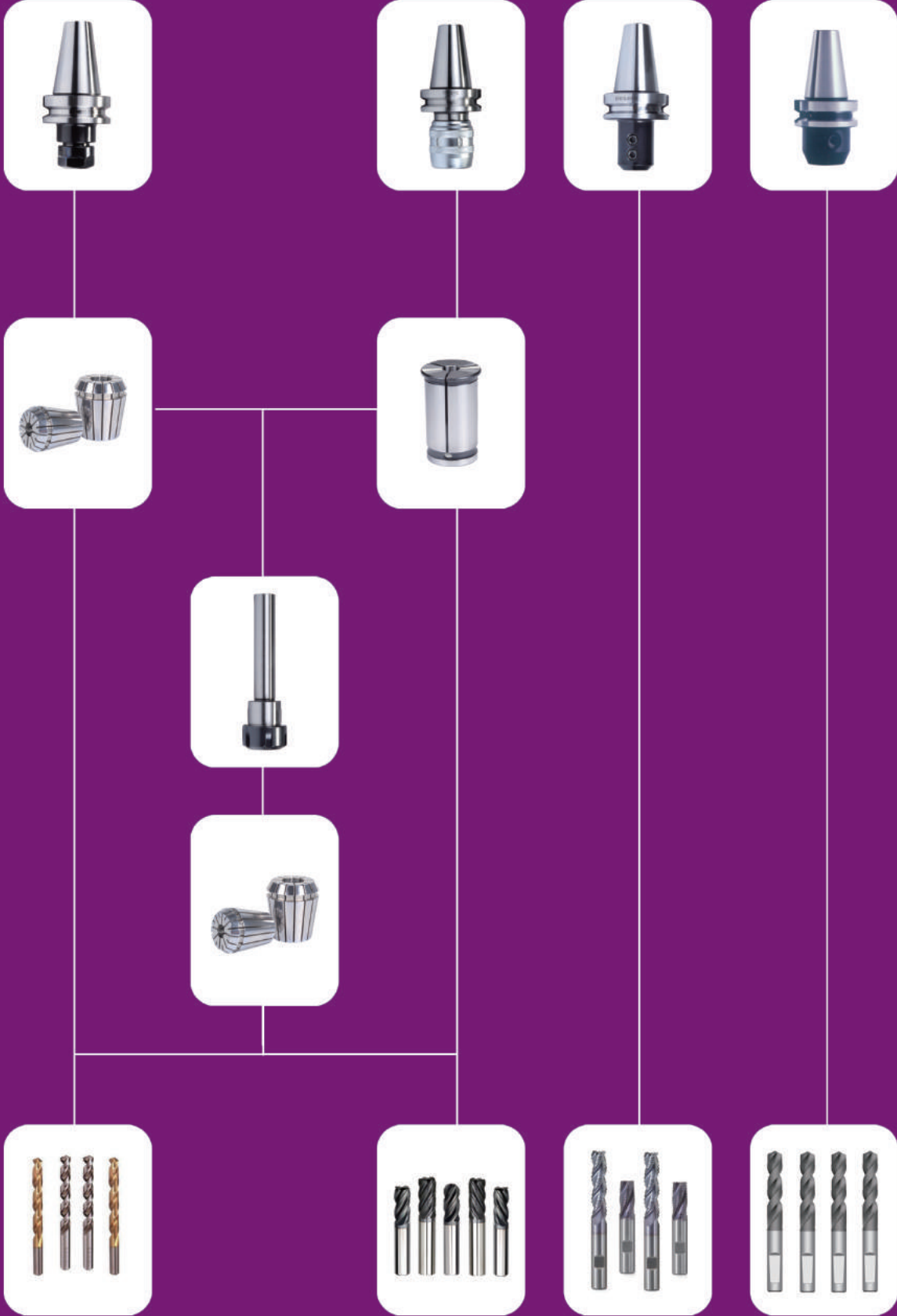
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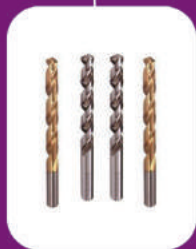
Vc=m/dak  
fz=mm/ağız





## Hassas Tutucu Takım Sistemleri







**PRO-X**



**4**

**4**  
PENSLE  
COLLETS

# PENSLE COLLETS

## ER PENS (DIN6499)

## ER COLLET

## ER8

Sipariş Kodu	Model	L	D	Kapasite	
PPE-0108-1	ER8	13,5	8	0,5-1 mm	
PPE-0108-1N5	ER8	13,5	8	1-1,5 mm	
PPE-0108-2	ER8	13,5	8	1,5-2 mm	
PPE-0108-2N5	ER8	13,5	8	2-2,5 mm	
PPE-0108-3	ER8	13,5	8	2,5-3 mm	
PPE-0108-3N5	ER8	13,5	8	3-3,5 mm	
PPE-0108-4	ER8	13,5	8	3,5-4 mm	
PPE-0108-4N5	ER8	13,5	8	4-4,5 mm	
PPE-0108-5	ER8	13,5	8	4,5-5 mm	



## ER11

Sipariş Kodu	Model	L	D	Kapasite	
PPE-0111-1	ER11	18	11	0,5-1 mm	
PPE-0111-1N5	ER11	18	11	1-1,5mm	
PPE-0111-2	ER11	18	11	1,5-2 mm	
PPE-0111-2N5	ER11	18	11	2-2,5 mm	
PPE-0111-3	ER11	18	11	2,5-3 mm	
PPE-0111-3N5	ER11	18	11	3-3,5 mm	
PPE-0111-4	ER11	18	11	3,5-4 mm	
PPE-0111-4N5	ER11	18	11	4-4,5 mm	
PPE-0111-5	ER11	18	11	4,5-5 mm	
PPE-0111-5N5	ER11	18	11	5-5,5 mm	
PPE-0111-6	ER11	18	11	5,5-6 mm	
PPE-0111-6N5	ER11	18	11	6-6,5 mm	
PPE-0111-7	ER11	18	11	6,5-7 mm	

## ER16

Sipariş Kodu	Model	L	D	Kapasite	
PPE-0116-1	ER16	27,5	16	0,5-1 mm	
PPE-0116-2	ER16	27,5	16	1-2 mm	
PPE-0116-3	ER16	27,5	16	2-3 mm	
PPE-0116-4	ER16	27,5	16	3-4 mm	
PPE-0116-5	ER16	27,5	16	4-5 mm	
PPE-0116-6	ER16	27,5	16	5-6 mm	
PPE-0116-7	ER16	27,5	16	6-7 mm	
PPE-0116-8	ER16	27,5	16	7-8 mm	
PPE-0116-9	ER16	27,5	16	8-9 mm	
PPE-0116-10	ER16	27,5	16	9-10 mm	

## ER PENS (DIN6499)

## ER COLLET

## ER20

Sipariş Kodu	Model	L	D	Kapasite	
PPE-0120-2	ER20	31,5	20	1-2 mm	
PPE-0120-3	ER20	31,5	20	2-3 mm	
PPE-0120-4	ER20	31,5	20	3-4 mm	
PPE-0120-5	ER20	31,5	20	4-5 mm	
PPE-0120-6	ER20	31,5	20	5-6 mm	
PPE-0120-7	ER20	31,5	20	6-7 mm	
PPE-0120-8	ER20	31,5	20	7-8 mm	
PPE-0120-9	ER20	31,5	20	8-9 mm	
PPE-0120-10	ER20	31,5	20	9-10 mm	
PPE-0120-11	ER20	31,5	20	10-11 mm	
PPE-0120-12	ER20	31,5	20	11-12 mm	
PPE-0120-13	ER20	31,5	20	12-13 mm	



## ER25

Sipariş Kodu	Model	L	D	Kapasite	
PPE-0125-2	ER25	34	25	1-2mm	
PPE-0125-3	ER25	34	25	2-3mm	
PPE-0125-4	ER25	34	25	3-4mm	
PPE-0125-5	ER25	34	25	4-5mm	
PPE-0125-6	ER25	34	25	5-6mm	
PPE-0125-7	ER25	34	25	6-7mm	
PPE-0125-8	ER25	34	25	7-8mm	
PPE-0125-9	ER25	34	25	8-9mm	
PPE-0125-10	ER25	34	25	9-10mm	
PPE-0125-11	ER25	34	25	10-11mm	
PPE-0125-12	ER25	34	25	11-12mm	
PPE-0125-13	ER25	34	25	12-13mm	
PPE-0125-14	ER25	34	25	13-14mm	
PPE-0125-15	ER25	34	25	14-15mm	
PPE-0125-16	ER25	34	25	15-16mm	

## ER PENS (DIN6499)

## ER COLLET

## ER32

Sipariş Kodu	Model	L	D	Kapasite	
PPE-0132-1	ER32	40	33	0,5-1 mm	
PPE-0132-2	ER32	40	33	1-2 mm	
PPE-0132-3	ER32	40	33	2-3 mm	
PPE-0132-4	ER32	40	33	3-4 mm	
PPE-0132-5	ER32	40	33	4-5 mm	
PPE-0132-6	ER32	40	33	5-6 mm	
PPE-0132-7	ER32	40	33	6-7 mm	
PPE-0132-8	ER32	40	33	7-8 mm	
PPE-0132-9	ER32	40	33	8-8 mm	
PPE-0132-10	ER32	40	33	8-10 mm	
PPE-0132-11	ER32	40	33	10-11 mm	
PPE-0132-12	ER32	40	33	11-12 mm	
PPE-0132-13	ER32	40	33	12-13 mm	
PPE-0132-14	ER32	40	33	13-14 mm	
PPE-0132-15	ER32	40	33	14-15 mm	
PPE-0132-16	ER32	40	33	15-16 mm	
PPE-0132-17	ER32	40	33	16-17 mm	
PPE-0132-18	ER32	40	33	17-18 mm	
PPE-0132-19	ER32	40	33	18-18 mm	
PPE-0132-20	ER32	40	33	19-20 mm	





**ER PENS (DIN6499)**

**ER COLLET**

**ER40**

Sipariş Kodu	Model	L	D	Kapasite	
PPE-0140-3	ER40	46	40	2-3 mm	
PPE-0140-4	ER40	46	40	3-4 mm	
PPE-0140-5	ER40	46	40	4-5 mm	
PPE-0140-6	ER40	46	40	5-6 mm	
PPE-0140-7	ER40	46	40	6-7 mm	
PPE-0140-8	ER40	46	40	7-8 mm	
PPE-0140-9	ER40	46	40	8-9 mm	
PPE-0140-10	ER40	46	40	9-10 mm	
PPE-0140-11	ER40	46	40	10-11 mm	
PPE-0140-12	ER40	46	40	11-12 mm	
PPE-0140-13	ER40	46	40	12-13 mm	
PPE-0140-14	ER40	46	40	13-14 mm	
PPE-0140-15	ER40	46	40	14-15 mm	
PPE-0140-16	ER40	46	40	15-16 mm	
PPE-0140-17	ER40	46	40	16-17 mm	
PPE-0140-18	ER40	46	40	17-18 mm	
PPE-0140-19	ER40	46	40	18-19 mm	
PPE-0140-20	ER40	46	40	19-20 mm	
PPE-0140-21	ER40	46	40	20-21 mm	
PPE-0140-22	ER40	46	40	21-22 mm	
PPE-0140-23	ER40	46	40	22-23 mm	
PPE-0140-24	ER40	46	40	23-24 mm	
PPE-0140-25	ER40	46	40	24-25 mm	
PPE-0140-26	ER40	46	40	25-26 mm	



**Setler**

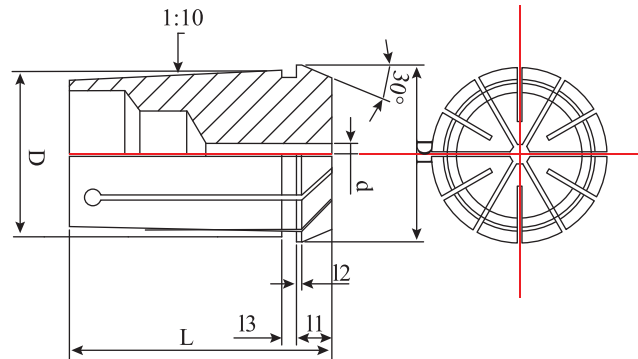
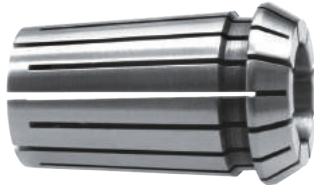
Sipariş Kodu	Model	L	D	Kapasite	Pens Adedi	
PPE-0108S	Pens Seti ER8	13,5	8,45	1-5 mm	9	
PPE-0111S	Pens Seti ER11	18	11,5	1-7 mm	13	
PPE-0116S	Pens Seti ER16	27,5	17	1-10 mm	10	
PPE-0120S	Pens Seti ER20	31,5	21	1-13 mm	12	
PPE-0125S	Pens Seti ER25	34	26	1-16 mm	15	
PPE-0132S	Pens Seti ER32	40	33	2-20 mm	18	
PPE-0140S	Pens Seti ER40	46	41	3-26 mm	23	

**OZ PENS (DIN6388)**

**OZ COLLET**

**OZ 25 (462-444)**

Sipariş Kodu	Model	L	D	Kapasite
PPE-0225B-2	OZ 25B	52	35,05	2-1,5 mm
PPE-0225B-3	OZ 25B	52	35,05	3-2,5 mm
PPE-0225B-4	OZ 25B	52	35,05	4-3,5 mm
PPE-0225B-5	OZ 25B	52	35,05	5-4,5 mm
PPE-0225B-6	OZ 25B	52	35,05	6-5,5 mm
PPE-0225B-7	OZ 25B	52	35,05	7-6,5 mm
PPE-0225B-8	OZ 25B	52	35,05	8-7,5 mm
PPE-0225B-9	OZ 25B	52	35,05	9-8,5 mm
PPE-0225B-10	OZ 25B	52	35,05	10-9,5 mm
PPE-0225B-11	OZ 25B	52	35,05	11-10,5 mm
PPE-0225B-12	OZ 25B	52	35,05	12-11,5 mm
PPE-0225B-13	OZ 25B	52	35,05	13-12,5 mm
PPE-0225B-14	OZ 25B	52	35,05	14-13,5 mm
PPE-0225B-15	OZ 25B	52	35,05	15-14,5 mm
PPE-0225B-16	OZ 25B	52	35,05	16-15,5 mm
PPE-0225B-17	OZ 25B	52	35,05	17-16,5 mm
PPE-0225B-18	OZ 25B	52	35,05	18-17,5 mm
PPE-0225B-19	OZ 25B	52	35,05	19-18,5 mm
PPE-0225B-20	OZ 25B	52	35,05	20-19,5 mm
PPE-0225B-21	OZ 25B	52	35,05	21-20,5 mm
PPE-0225B-22	OZ 25B	52	35,05	22-21,5 mm
PPE-0225B-23	OZ 25B	52	35,05	23-22,5 mm
PPE-0225B-24	OZ 25B	52	35,05	24-23,5 mm
PPE-0225B-25	OZ 25B	52	35,05	25-24,5 mm

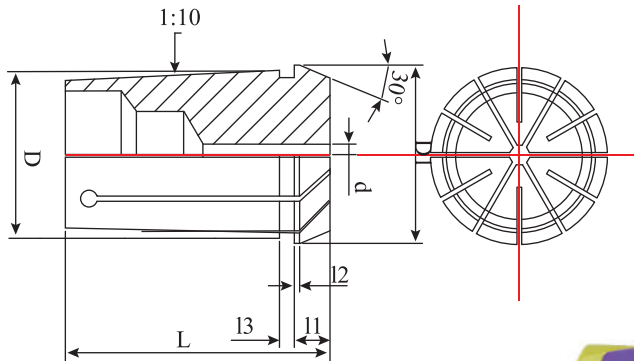
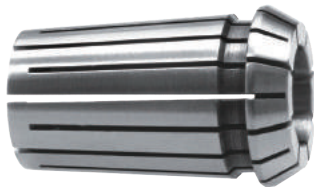


**OZ PENS (DIN6388)**

**OZ COLLET**

**OZ 32 (467)**

Sipariş Kodu	Model	L	D	Kapasite
PPE-0232B-3	OZ 32B	60	43.7	3-2,5 mm
PPE-0232B-4	OZ 32B	60	43.7	4-3,5 mm
PPE-0232B-5	OZ 32B	60	43.7	5-4,5 mm
PPE-0232B-6	OZ 32B	60	43.7	6-5,5 mm
PPE-0232B-7	OZ 32B	60	43.7	7-6,5 mm
PPE-0232B-8	OZ 32B	60	43.7	8-7,5 mm
PPE-0232B-9	OZ 32B	60	43.7	8-8,5 mm
PPE-0232B-10	OZ 32B	60	43.7	10-8,5 mm
PPE-0232B-11	OZ 32B	60	43.7	11-10,5mm
PPE-0232B-12	OZ 32B	60	43.7	12-11,5 mm
PPE-0232B-13	OZ 32B	60	43.7	13-12,5 mm
PPE-0232B-14	OZ 32B	60	43.7	14-13,5 mm
PPE-0232B-15	OZ 32B	60	43.7	15-14,5 mm
PPE-0232B-16	OZ 32B	60	43.7	16-15,5 mm
PPE-0232B-17	OZ 32B	60	43.7	17-16,5 mm
PPE-0232B-18	OZ 32B	60	43.7	18-17,5 mm
PPE-0232B-19	OZ 32B	60	43.7	18-18,5 mm
PPE-0232B-20	OZ 32B	60	43.7	20-18,5 mm
PPE-0232B-21	OZ 32B	60	43.7	21-20,5 mm
PPE-0232B-22	OZ 32B	60	43.7	22-21,5 mm
PPE-0232B-23	OZ 32B	60	43.7	23-22,5 mm
PPE-0232B-24	OZ 32B	60	43.7	24-23,5 mm
PPE-0232B-25	OZ 32B	60	43.7	25-24,5 mm
PPE-0232B-26	OZ 32B	60	43.7	26-25,5 mm
PPE-0232B-27	OZ 32B	60	43.7	27-26,5 mm
PPE-0232B-28	OZ 32B	60	43.7	28-27,5 mm
PPE-0232B-29	OZ 32B	60	43.7	28-28,5 mm
PPE-0232B-30	OZ 32B	60	43.7	30-28,5 mm
PPE-0232B-31	OZ 32B	60	43.7	31-30,5 mm
PPE-0232B-32	OZ 32B	60	43.7	32-31,5 mm



**Setler**

Sipariş Kodu	Model	L	D	Kapasite	Pens Adedi
PPE-0225BS	Pens Seti OZ25B	52	35,05	4-25 mm	16
PPE-0232BS	Pens Seti OZ32B	60	43,7	5-32 mm	16



**SC RULMANLI TUTUCU PENİSİ**  
**STRAIGHT SHANK COLLET**

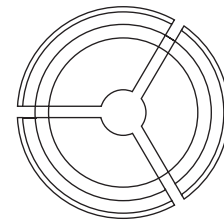
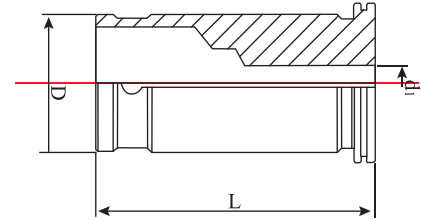
**SC 25**

Sipariş Kodu	Model	d	D	L	Kapasite
PPE-0325-3	SC25	3	25	60	3-2 mm
PPE-0325-4	SC25	4	25	60	4-3 mm
PPE-0325-5	SC25	5	25	60	5-4 mm
PPE-0325-6	SC25	6	25	60	6-5 mm
PPE-0325-7	SC25	7	25	60	7-6 mm
PPE-0325-8	SC25	8	25	60	8-7 mm
PPE-0325-9	SC25	9	25	60	9-8 mm
PPE-0325-10	SC25	10	25	60	10-9 mm
PPE-0325-11	SC25	11	25	60	11-10 mm
PPE-0325-12	SC25	12	25	60	12-11 mm
PPE-0325-13	SC25	13	25	60	13-12 mm
PPE-0325-14	SC25	14	25	60	14-13 mm
PPE-0325-15	SC25	15	25	60	15-14 mm
PPE-0325-16	SC25	16	25	60	16-15 mm
PPE-0325-17	SC25	17	25	60	17-16 mm
PPE-0325-18	SC25	18	25	60	18-17 mm
PPE-0325-19	SC25	19	25	60	19-18 mm
PPE-0325-20	SC25	20	25	60	20-19 mm



**SC 32**

Sipariş Kodu	Model	d	D	L	Kapasite
PPE-0332-3	SC32	3	32	65	3-2mm
PPE-0332-4	SC32	4	32	65	4-3mm
PPE-0332-5	SC32	5	32	65	5-4mm
PPE-0332-6	SC32	6	32	65	6-5mm
PPE-0332-7	SC32	7	32	65	7-6mm
PPE-0332-8	SC32	8	32	65	8-7mm
PPE-0332-9	SC32	9	32	65	9-8mm
PPE-0332-10	SC32	10	32	65	10-9mm
PPE-0332-11	SC32	11	32	65	11-10mm
PPE-0332-12	SC32	12	32	65	12-11 mm
PPE-0332-13	SC32	13	32	65	13-12mm
PPE-0332-14	SC32	14	32	65	14-13mm
PPE-0332-15	SC32	15	32	65	15-14mm
PPE-0332-16	SC32	16	32	65	16-15mm
PPE-0332-17	SC32	17	32	65	17-16mm
PPE-0332-18	SC32	18	32	65	18-17mm
PPE-0332-19	SC32	19	32	65	19-18mm
PPE-0332-20	SC32	20	32	65	20-19mm
PPE-0332-21	SC32	21	32	65	21-20mm
PPE-0332-22	SC32	22	32	65	22-21mm
PPE-0332-23	SC32	23	32	65	23-22mm
PPE-0332-24	SC32	24	32	65	24-23mm
PPE-0332-25	SC32	25	32	65	25-24mm



**PRO-X**



**5**

# TUTUCULAR CHUCKS

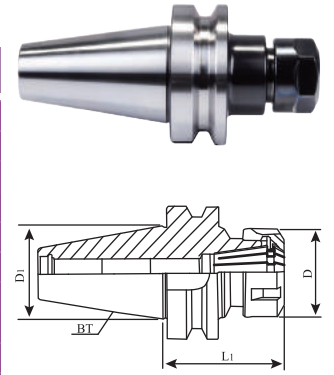
TUTUCULAR  
CHUCKS  
**5**

**ER PENS BAŞLIĞI - JIS B 6339 (MAS 403 BT)**

**ER MILLING CHUCK ARBOR**

**DIN 6391**

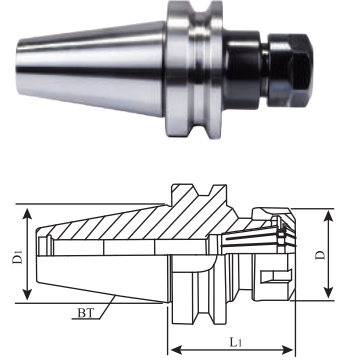
Sipariş Kodu	Model	D	D1	L1	Kapasite
PTU-110116-70	BT30-ER16-70	32	31,75	70	1-10 mm
PTU-110116-100	BT30-ER16-100	32	31,75	100	1-10 mm
PTU-110116-160	BT30-ER16-160	32	31,75	160	1-10 mm
PTU-110125-70	BT30-ER25-70	42	31,75	70	1-16 mm
PTU-110125-100	BT30-ER25-100	42	31,75	100	1-16 mm
PTU-110125-160	BT30-ER25-160	42	31,75	160	1-16 mm
PTU-110132-70	BT30-ER32-70	50	31,75	70	2-20 mm
PTU-110132-100	BT30-ER32-100	50	31,75	100	2-20 mm
PTU-110132-160	BT30-ER32-160	50	31,75	160	2-20 mm
PTU-110140-80	BT30-ER40-80	63	31,75	80	3-26 mm
PTU-110140-100	BT30-ER40-100	63	31,75	100	3-26 mm
PTU-110140-160	BT30-ER40-160	63	31,75	160	3-26 mm
PTU-120108-100M	BT40-ER8-100 Mini	12	44,45	100	1-5 mm
PTU-120111-70M	BT40-ER11-70 Mini	16	44,45	70	1-7 mm
PTU-120111-100M	BT40-ER11-100 Mini	16	44,45	100	1-7 mm
PTU-120116-63	BT40-ER16-63	32	44,45	63	1-10 mm
PTU-120116-70M	BT40-ER16-70 Mini	22	44,45	70	1-10 mm
PTU-120116-100	BT40-ER16-100	32	44,45	100	1-10 mm
PTU-120116-100M	BT40-ER16-100 Mini	22	44,45	100	1-10 mm
PTU-120116-160	BT40-ER16-160	32	44,45	160	1-10 mm
PTU-120116-160M	BT40-ER16-160 Mini	22	44,45	160	1-10 mm
PTU-120125-70	BT40-ER25-70	42	44,45	70	1-16 mm
PTU-120125-100	BT40-ER25-100	42	44,45	100	1-16 mm
PTU-120125-160	BT40-ER25-160	42	44,45	160	1-16 mm
PTU-120132-70	BT40-ER32-70	50	44,45	70	2-20 mm
PTU-120132-100	BT40-ER32-100	50	44,45	100	2-20 mm
PTU-120132-160	BT40-ER32-160	50	44,45	160	2-20 mm
PTU-120140-80	BT40-ER40-80	63	44,45	80	3-26 mm
PTU-120140-100	BT40-ER40-100	63	44,45	100	3-26 mm
PTU-120140-160	BT40-ER40-160	63	44,45	160	3-26 mm
PTU-130116-70	BT50-ER16-70	28	69,85	70	1-10 mm
PTU-130116-100	BT50-ER16-100	28	69,85	100	1-10 mm
PTU-130116-160	BT50-ER16-160	28	69,85	160	1-10 mm
PTU-130116-200	BT50-ER16-200	28	69,85	200	1-10 mm



**ER PENS BAŞLIĞI - JIS B 6339 (MAS 403 BT)**  
**ER MILLING CHUCK ARBOR**

**DIN 6391**

Sipariş Kodu	Model	D	D1	L1	Kapasite
PTU-130125-70	BT50-ER25-70	42	68,85	70	1-16 mm
PTU-130125-100	BT50-ER25-100	42	68,85	100	1-16 mm
PTU-130125-160	BT50-ER25-160	42	68,85	160	1-16 mm
PTU-130125-200	BT50-ER25-200	42	68,85	200	1-16 mm
PTU-130125-250	BT50-ER25-250	42	69,85	250	1-16 mm
PTU-130132-70	BT50-ER32-70	50	68,85	70	2-20 mm
PTU-130132-100	BT50-ER32-100	50	68,85	100	2-20 mm
PTU-130132-160	BT50-ER32-160	50	68,85	160	2-20 mm
PTU-130132-200	BT50-ER32-200	50	68,85	200	2-20 mm
PTU-130132-250	BT50-ER32-250	50	69,85	250	2-20 mm
PTU-130140-80	BT50-ER40-80	63	68,85	80	3-26 mm
PTU-130140-100	BT50-ER40-100	63	68,85	100	3-26 mm
PTU-130140-160	BT50-ER40-160	63	68,85	160	3-26 mm
PTU-130140-200	BT50-ER40-200	63	69,85	200	3-26 mm
PTU-130140-250	BT50-ER40-250	63	69,85	250	3-26 mm



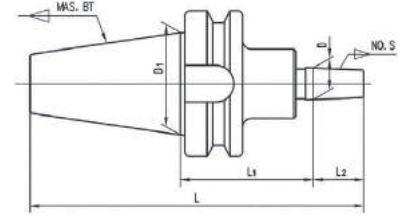
**ER Pens Başlığı ve Setleri**  
**ER Milling Chuck Arbor and Sets**

Sipariş Kodu	Model	D	D1	L1	Kapasite
PTU-120132-70S	BT40-ER32-70	50	44,45	70	3-20 mm
PTU-120132-100S	BT40-ER32-100	50	44,45	100	3-20 mm
PTU-120140-80S	BT40-ER40-80	63	44,45	80	4-26 mm
PTU-120140-100S	BT40-ER40-100	63	44,45	100	4-26 mm

**MANDREN MALAFASI - DIN 238 (MAS 403 BT)**  
**DRILL CHUCK ARBOR**

**DIN 238**

Sipariş Kodu	Model	d	A	L	
PTU-110712-25	BT30-B12-25	B12	25	18,5	
PTU-110716-25	BT30-B16-25	B16	25	24	
PTU-110718-25	BT30-B18-25	B18	25	32	
PTU-120712-30	BT40-B12-30	B12	30	18,5	
PTU-120716-30	BT40-B16-30	B16	30	24	
PTU-120718-30	BT40-B18-30	B18	30	32	
PTU-130712-45	BT50-B12-45	B12	45	18,5	
PTU-130716-45	BT50-B16-45	B16	45	24	
PTU-130718-45	BT50-B18-45	B18	45	32	

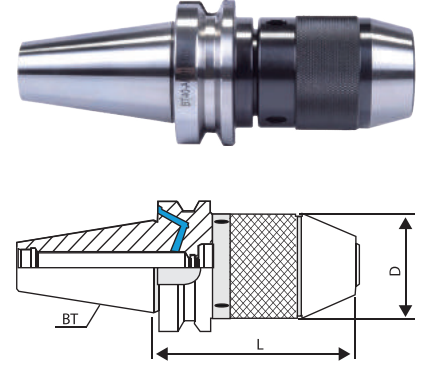




**MANDRENLİ TUTUCU - APU (MAS 403 BT)**  
**SELF - FASTEN DRILL CHUCK**

**Mandrenli Tutucu (APU)**

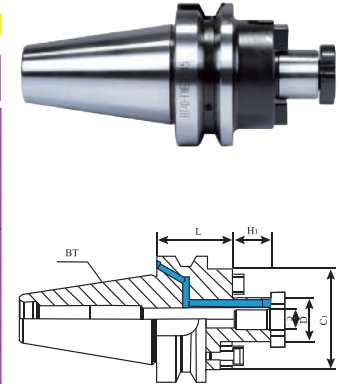
Sipariş Kodu	Model	Kapasite	D	L
PTU-110608-80	BT30-APU8-80	1-8	37	80
PTU-110613-130	BT30-APU13-130	1-13	50	130
PTU-110616-115	BT30-APU16-115	3-16	54	115
PTU-120608-85	BT40-APU8-85	1-8	37	85
PTU-120613-100	BT40-APU13-100	1-13	50	100
PTU-120616-105	BT40-APU16-105	3-16	54	105
PTU-130608-90	BT50-APU8-110	1-8	37	90
PTU-130613-100	BT50-APU13-100	1-13	50	100
PTU-130616-130	BT50-APU16-130	3-16	58	130



**ALIN KAMALI TARAMA BAŞLIĞI MALAFASI - DIN 6357 (MAS 403 BT)**  
**FACE SHELL MILL ARBOR**

**DIN 6357**

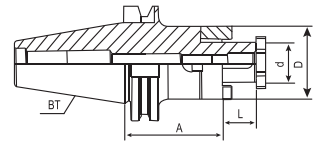
Sipariş Kodu	Model	D	L	C1	H1
PTU-110516-40	BT30-ATB16-40	16	38	17	40
PTU-110522-40	BT30-ATB22-40	22	48	19	40
PTU-110527-40	BT30-ATB27-40	27	58	21	40
PTU-110532-50	BT30-ATB32-50	32	78	24	50
PTU-120516-40	BT40-ATB16-40	16	38	17	40
PTU-120516-100	BT40-ATB16-100	16	38	17	100
PTU-120516-160	BT40-ATB16-160	16	38	17	160
PTU-120522-40	BT40-ATB22-40	22	48	19	40
PTU-120522-100	BT40-ATB22-100	22	48	19	100
PTU-120522-160	BT40-ATB22-160	22	48	19	160
PTU-120522-250	BT40-ATB22-250	22	48	19	250
PTU-120527-40	BT40-ATB27-40	27	58	21	40
PTU-120527-100	BT40-ATB27-100	27	58	21	100
PTU-120527-160	BT40-ATB27-160	27	58	21	160
PTU-120527-250	BT40-ATB27-250	27	58	21	250
PTU-120532-50	BT40-ATB32-50	32	78	24	50
PTU-120532-100	BT40-ATB32-100	32	78	24	100
PTU-120532-160	BT40-ATB32-160	32	78	24	160
PTU-120532-250	BT40-ATB32-250	32	78	24	250
PTU-120540-50	BT40-ATB40-50	40	88	27	50
PTU-120540-100	BT40-ATB40-100	40	88	27	100
PTU-120540-160	BT40-ATB40-160	40	88	27	160
PTU-130522-40	BT50-ATB22-40	22	48	19	40
PTU-130522-100	BT50-ATB22-100	22	48	19	100
PTU-130522-160	BT50-ATB22-160	22	48	19	160
PTU-130522-250	BT50-ATB22-250	22	48	19	250
PTU-130527-40	BT50-ATB27-40	27	58	21	40
PTU-130527-100	BT50-ATB27-100	27	58	21	100
PTU-130527-160	BT50-ATB27-160	27	58	21	160
PTU-130532-50	BT50-ATB32-50	32	78	24	50
PTU-1 30532-100	BT50-ATB32-100	32	78	24	100
PTU-1 30540-50	BT50-ATB40-50	40	88	27	50
PTU-1 30540-100	BT50-ATB40-100	40	88	27	100



**KOMBİNE TARAMA BAŞLIĞI MALAFASI - DIN 6358 (MAS 403 BT)**  
**COMBI SHELL AND MILL ARBOR**

**DIN 6358**

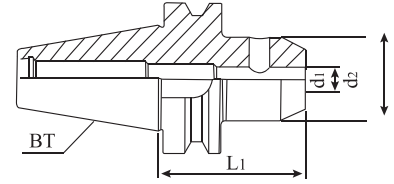
Sipariş Kodu	Model	d	D	L	A
PTU-110416-45	BT30-KTB16-45	16	32	17	45
PTU-110422-47	BT30-KTB22-47	22	40	19	47
PTU-110427-49	BT30-KTB27-49	27	48	21	49
PTU-120416-55	BT40-KTB16-55	16	32	17	55
PTU-120416-100	BT40-KTB16-100	16	32	17	100
PTU-120416-160	BT40-KTB16-160	16	32	17	160
PTU-120422-55	BT40-KTB22-55	22	40	19	55
PTU-120422-100	BT40-KTB22-100	22	40	19	100
PTU-120422-160	BT40-KTB22-160	22	40	19	160
PTU-120427-55	BT40-KTB27-55	27	48	21	55
PTU-120427-100	BT40-KTB27-100	27	48	21	100
PTU-120427-160	BT40-KTB27-160	27	48	21	160
PTU-120432-60	BT40-KTB32-60	32	58	24	60
PTU-120432-100	BT40-KTB32-100	32	58	24	100
PTU-120432-160	BT40-KTB32-160	32	58	24	160
PTU-120440-60	BT40-KTB40-60	40	70	27	60
PTU-120440-100	BT40-KTB40-100	40	70	27	100
PTU-120440-160	BT40-KTB40-160	40	70	27	160
PTU-130416-70	BT50-KTB16-70	16	32	17	70
PTU-130422-70	BT50-KTB22-70	22	40	19	70
PTU-130422-100	BT50-KTB22-100	22	40	19	100
PTU-130427-70	BT50-KTB27-70	27	48	21	70
PTU-130432-70	BT50-KTB32-70	32	58	24	70
PTU-130440-70	BT50-KTB40-70	40	70	27	70



**SİLİNDİRİK ŞAFTLI VELDON TUTUCU - DIN 6359 (MAS 403 BT)**  
**SIDE LOCK END MILL HOLDER**

**DIN 6359**

Sipariş Kodu	Model	d1	d2	L1
PTU-110806-50	BT30X6-50	6	25	50
PTU-110808-50	BT30X8-50	8	28	50
PTU-110810-50	BT30X10-50	10	35	50
PTU-110812-50	BT30X12-50	12	42	50
PTU-110814-50	BT30X14-50	14	44	50
PTU-110816-63	BT30X16-63	16	48	75
PTU-110818-63	BT30X18-63	18	48	63
PTU-110820-63	BT30X20-63	20	52	63
PTU-110825-90	BT30X25-90	25	65	90
PTU-120806-50	BT40X6-50	6	25	50
PTU-120806-100	BT40X6-100	6	25	100
PTU-120808-50	BT40X8-50	8	28	50
PTU-120808-100	BT40X8-100	8	28	100
PTU-120810-63	BT40X10-63	10	35	63
PTU-120810-100	BT 40X10-100	10	35	100
PTU-120812-63	BT40X12-63	12	42	63
PTU-120812-100	BT40X12-100	12	42	100
PTU-120814-63	BT40X14-63	14	44	63
PTU-120814-100	BT40X14-100	14	44	100
PTU-120816-63	BT40X16-63	16	48	63
PTU-120816-100	BT40X16-100	16	48	100
PTU-120818-63	BT40X18-63	18	48	63
PTU-120818-100	BT40X18-100	18	48	100
PTU-120820-63	BT40X20-63	20	52	63
PTU-120820-100	BT 40X20-00	20	52	100
PTU-120825-90	BT40X25-90	25	65	90
PTU-120825-160	BT40X25-160	25	65	160
PTU-120832-100	BT40X32-100	32	72	100
PTU-120832-160	BT40X32-160	32	72	160
PTU-120840-120	BT 40X40-120	40	80	120
PTU-120840-160	BT 40X40-160	40	80	160
PTU-130806-63	BT50X6-63	6	25	63
PTU-130808-63	BT50X8-63	8	28	63
PTU-130810-63	BT50X10-63	10	35	63
PTU-130812-80	BT50X12-80	12	42	80
PTU-130814-80	BT50X14-80	14	44	80
PTU-130816-80	BT50X16-80	16	48	80
PTU-130818-80	BT50X18-80	18	48	80
PTU-130820-80	BT50X20-80	20	52	80
PTU-130825-100	BT50X25-100	25	65	100
PTU-130825-160	BT50X25-160	25	65	160
PTU-130832-105	BT50X32-105	32	72	105
PTU-130840-110	BT50X40-110	40	90	110

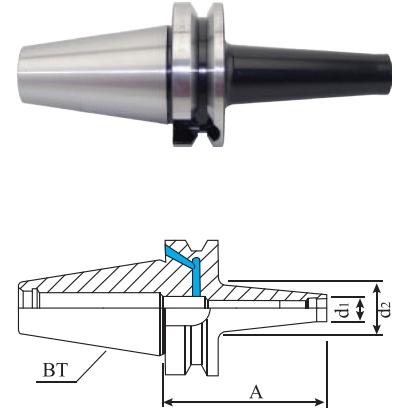


## VİDALI TUTUCU (MAS 403 BT)

### SCREW ON TYPE MILLING CUTTER ARBOR

#### Vidalı Tutucu

Sipariş Kodu	Model	M	d1	d2	A	L
PTU-120908-50	BT40-M8-50	M8	8,5	13	77	50
PTU-120908-100	BT40-M8-100	M8	8,5	13	127	100
PTU-120908-150	BT40-M8-150	M8	8,5	13	177	150
PTU-120910-50	BT40-M10-50	M10	10,5	18	77	50
PTU-120910-100	BT40-M10-100	M10	10,5	18	127	100
PTU-120910-150	BT40-M10-150	M10	10,5	18	177	150
PTU-120912-50	BT40-M12-50	M12	12,5	21	77	50
PTU-120912-100	BT40-M12-100	M12	12,5	21	127	100
PTU-120912-150	BT40-M12-150	M12	12,5	21	177	150
PTU-120916-50	BT40-M16-50	M16	17	29	77	50
PTU-120916-100	BT40-M16-100	M16	17	29	127	100
PTU-120916-150	BT40-M16-150	M16	17	29	177	150
PTU-130908-100	BT50-M8-100	M8	8,5	13	138	100
PTU-130908-150	BT50-M8-150	M8	8,5	13	188	150
PTU-130910-100	BT50-M10-100	M10	10,5	18	138	100
PTU-130910-150	BT50-M10-150	M10	10,5	18	188	150
PTU-130912-100	BT50-M12-100	M12	12,5	21	138	100
PTU-130912-150	BT50-M12-150	M12	12,5	21	188	150
PTU-130916-100	BT50-M16-100	M16	17	29	138	100
PTU-130916-150	BT50-M16-150	M16	17	29	188	150

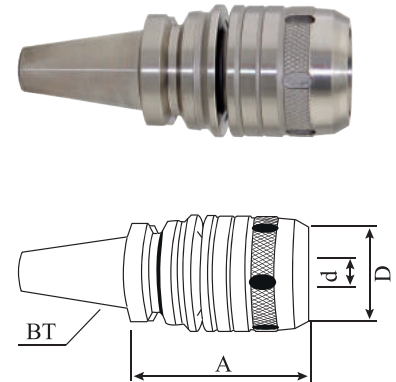


## RULMANLI TUTUCU (MAS 403 BT)

### POWER MILLING CHUCK

#### Rulmanlı Tutucu

Sipariş Kodu	Model	A	d	D
PTU-110325-90	BT30-C25-90	90	25	59
PTU-120325-100	BT40-C25-100	100	25	59
PTU-120332-90	BT40-C32-90	90	32	70
PTU130325-105	BT50-C25-105	105	25	59
PTU-130332-110	BT50-C32-110	110	32	70



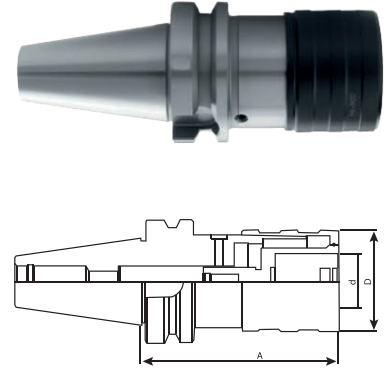
#### Rulmanlı Tutucu ve Pens Seti

##### Power Milling Chuck & Collet Set

Sipariş Kodu	Model	A	d	D	Kapasite
PTU-110325-90S	BT30-C25-90 SET	90	25	59	6-20mm
PTU-120325-100S	BT40-C25-100 SET	100	25	59	6-20mm
PTU-120332-90S	BT40-C32-90 SET	90	32	70	6-25mm
PTU-130332-110S	BT50-C32-110 SET	110	32	70	6-25mm

**KILAVUZ ÇEKME BAŞLIĞI (MAS 403 BT)**  
**TAPPING CHUCK ARBOR****Kılavuz Çekme Başlığı**

Sipariş Kodu	Model	A	d	D	
PTU-111314	BT30xM2-M14	62	19	36	
PTU-111324	BT30xM5-M24	95	31	54	
PTU-121314	BT40xM2-M14	65	19	36	
PTU-121324	BT40xM5-M24	93	31	54	
PTU-121336	BT40xM14-M36	166	48	7B	
PTU-131314	BT50xM2-M14	100	19	36	
PTU-131324	BT50xM5-M24	100	31	54	

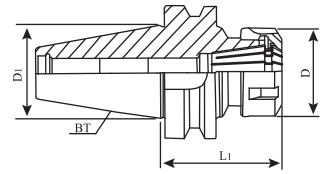


**BBT ER PENS BAŞLIĞI DIN6499**

**BBT ER COLLET CHUCK DIN6499**

**DIN 6499**

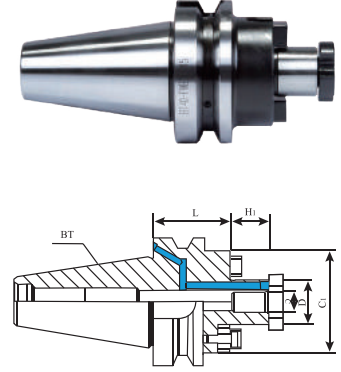
Sipariş Kodu	Model	Kapasite	D	L
PTU-720111-70M	BBT40-ER11-70 Mini	1-7 mm	16	70
PTU-720111-100M	BBT40-ER11-100 Mini	1-7 mm	16	100
PTU-720111-160M	BBT40-ER11-160 Mini	1-7 mm	16	160
PTU-720116-63	BBT40-ER16-63	1-10 mm	32	63
PTU-720116-70M	BBT40-ER16-70 Mini	1-10 mm	22	70
PTU-720116-100	BBT40-ER16-100	1-10 mm	32	100
PTU-720116-100M	BBT40-ER16-100 Mini	1-10 mm	22	100
PTU-720116-160	BBT40-ER16-160	1-10 mm	32	160
PTU-720116-160M	BBT40-ER16-160 Mini	1-10 mm	22	160
PTU-720125-60	BBT40-ER25-60	2-16 mm	42	60
PTU-20125-100	BBT40-ER25-100	2-16 mm	42	100
PTU-720125-160	BBT40-ER25-160	2-16 mm	42	160
PTU-720132-70	BBT40-ER32-70	2-20 mm	50	70
PTU-720132-100	BBT40-ER32-100	2-20 mm	50	100
PTU-720132-160	BBT40-ER32-160	2-20 mm	50	160
PTU-720140-80	BBT40-ER40-80	3-26 mm	63	80
PTU-720140-100	BBT40-ER40-100	3-26 mm	63	100
PTU-720140-160	BBT40-ER40-160	3-26 mm	63	160
PTU-730116-100	BBT50-ER16-100	1-10 mm	32	100
PTU-730125-60	BBT50-ER25-60	2-16 mm	42	60
PTU-730125-100	BBT50-ER25-100	2-16 mm	42	100
PTU-730125-160	BBT50-ER25-160	2-16 mm	42	160
PTU-730132-70	BBT50-ER32-70	2-20 mm	50	70
PTU-730132-100	BBT50-ER32-100	2-20 mm	50	100
PTU-730132-160	BBT50-ER32-160	2-20 mm	50	160
PTU-730140-80	BBT50-ER40-80	3-26 mm	63	80
PTU-730140-100	BBT50-ER40-100	3-26 mm	63	100



**BBT ALIN KAMALI TARAMA BAŞLIĞI MALAFASI DIN 6357**  
**BBT FACE SHELL MILL ARBOR**

**DIN 6357**

Sipariş Kodu	Model	d	A	l	D
PTU-720516-40	BBT40-ATB16-40	16	40	17	38
PTU-720522-40	BBT40-ATB22-40	22	40	19	48
PTU-720527-40	BBT40-ATB27-40	27	40	21	58
PTU-720532-50	BBT40-ATB32-50	32	50	24	78
PTU-720540-50	BBT40-ATB40-50	40	50	27	88
PTU-730522-40	BBT50-ATB22-40	22	40	19	48
PTU-730527-40	BBT50-ATB27-40	27	40	21	58
PTU-730532-50	BBT50-ATB32-50	32	50	24	78
PTU-730540-50	BBT50-ATB40-50	40	50	27	88

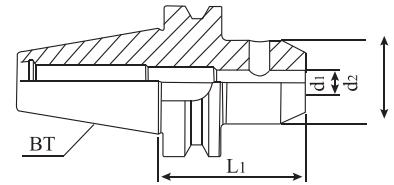


## BBT SİLİNDİRİK ŞAFTLI VELDON TUTUCU DIN 6359

### BBT SIDE LOCK END MILL HOLDER

#### DIN 1835-B

Sipariş Kodu	Model	d	L	D	
PTU-720806-50	BBT40X6-50	6	50	25	
PTU-720806-100	BBT40X6-100	6	100	25	
PTU-720808-50	BBT40X8-50	8	50	28	
PTU-720808-100	BBT40X8-100	8	100	28	
PTU-720810-63	BBT40X10-63	10	63	35	
PTU-720810-100	BBT40X10-100	10	100	35	
PTU-720812-63	BBT40X12-63	12	63	42	
PTU-720812-100	BBT40X12-100	12	100	42	
PTU-720814-63	BBT40X14-50	14	63	44	
PTU-720814-100	BBT40X14-100	14	100	44	
PTU-720816-63	BBT40X16-63	16	63	48	
PTU-720816-100	BBT40X16-100	16	100	48	
PTU-720818-63	BBT40X18-63	18	63	50	
PTU-720818-100	BBT40X18-100	18	100	50	
PTU-720820-63	BBT40X20-63	20	63	52	
PTU-720820-100	BBT40X20-100	20	100	52	
PTU-720825-90	BBT40X25-90	25	90	63	
PTU-720832-100	BBT40X32-100	32	100	72	
PTU-720840-120	BBT40X40-120	40	120	80	
PTU-730806-63	BBT50X6-63	6	63	25	
PTU-730808-63	BBT50X8-63	8	63	28	
PTU-730810-63	BBT50X10-63	10	63	35	
PTU-730812-80	BBT50X12-80	12	80	42	
PTU-730814-80	BBT50X14-80	14	80	44	
PTU-730816-80	BBT50X16-80	16	80	50	
PTU-730818-80	BBT50X18-80	18	80	50	
PTU-730820-80	BBT50X20-80	20	80	52	
PTU-730825-100	BBT50X25-100	25	100	63	
PTU-730832-105	BBT50X32-105	32	105	72	
PTU-730840-110	BBT50X40-110	40	110	80	

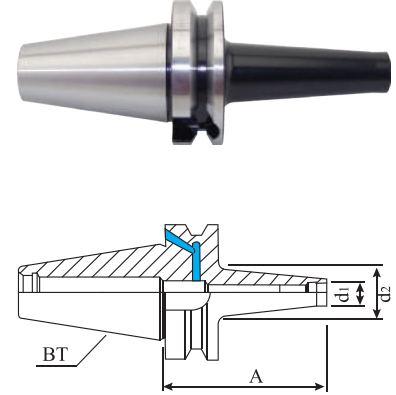




**BBT VİDALI FREZE TAKIM TUTUCULARI**  
**BBT SCREW ON TYPE MILLING CUTTER ARBOR**

**Vidalı Tutucu**

Sipariş Kodu	Model	M	A	L	
PTU-720908-50	BBT40-M8-50	M8	77	50	
PTU-720908-100	BBT40-M8-100	M8	127	100	
PTU-720908-150	BBT40-M8-150	M8	177	150	
PTU-720910-50	BBT40-M10-50	M10	77	50	
PTU-720910-100	BBT40-M10-100	M10	127	100	
PTU-720910-150	BBT40-M10-150	M10	177	150	
PTU-720912-50	BBT40-M12-50	M12	77	50	
PTU-720912-100	BBT40-M12-100	M12	127	100	
PTU-720912-150	BBT40-M12-150	M12	177	150	
PTU-720916-50	BBT40-M16-50	M16	77	50	
PTU-720916-100	BBT40-M16-100	M16	127	100	
PTU-720916-150	BBT40-M16-150	M16	177	150	
PTU-730908-100	BBT50-M8-100	M8	138	100	
PTU-730908-150	BBT50-M8-150	M8	188	150	
PTU-730910-100	BBT50-M10-100	M10	138	100	
PTU-730910-150	BBT50-M10-150	M10	188	150	
PTU-730912-100	BBT50-M12-100	M12	138	100	
PTU-730912-150	BBT50-M12-150	M12	188	150	
PTU-730916-100	BBT50-M16-100	M16	138	100	
PTU-730916-150	BBT50-M16-150	M16	188	150	



**BBT RULMANLI TUTUCU**  
**BBT STRAIGHT SHANK COLLET**

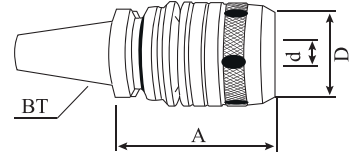
**Rulmanlı Tutucu**

Sipariş Kodu	Model	D	A	Kapasite
PTU-720325-100	BBT40-C25-100	49	100	6-20 mm
PTU-720332-105	BBT40-C32-105	68	105	6-32 mm
PTU-730325-105	BBT50-C25-105	49	105	6-20 mm
PTU-730332-110	BBT50-C32-110	68	110	6-32 mm



**Rulmanlı Tutucu ve Pens Seti**

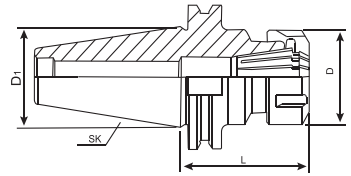
Sipariş Kodu	Model	A	d	D	Kapasite
PTU-720325-100S	BBT40-C25-100 SET	100	25	59	6-20mm
PTU-720332-105S	BBT40-C32-105 SET	90	32	70	6-25mm
PTU-730332-110S	BBT50-C32-110 SET	110	32	70	6-25mm



**ER PENS BAŞLIĞI - DIN 69871 SK**  
**ER MILLING CHUCK ARBOR**

**DIN 6388**

Sipariş Kodu	Model	D	D1	L1	Kapasite
PTU-210116-70	SK30-ER16-70	28	31,75	70	1-10 mm
PTU-210116-100	SK30-ER16-100	28	31,75	100	1-10 mm
PTU-210116-160	SK30-ER16-160	28	31,75	160	1-10 mm
PTU-210125-70	SK30-ER25-70	42	31,75	70	1-16 mm
PTU-210125-100	SK30-ER25-100	42	31,75	100	1-16 mm
PTU-210125-160	SK30-ER25-160	42	31,75	160	1-16 mm
PTU-210132-70	SK30-ER32-70	50	31,75	70	2-20 mm
PTU-210132-100	SK30-ER32-100	50	31,75	100	2-20 mm
PTU-210132-160	SK30-ER32-160	50	31,75	160	2-20 mm
PTU-210140-70	SK30-ER40-70	63	31,75	70	3-26 mm
PTU-210140-100	SK30-ER40-100	63	31,75	100	3-26 mm
PTU-210140-160	SK30-ER40-160	63	31,75	160	3-26 mm
PTU-220116-63	SK40-ER16-63	32	44,45	63	1-10 mm
PTU-220116-100	SK40-ER16-100	32	44,45	100	1-10 mm
PTU-220116-160	SK40-ER16-160	32	44,45	160	1-10 mm
PTU-220125-60	SK40-ER25-60	42	44,45	60	1-16 mm
PTU-220125-100	SK40-ER25-100	42	44,45	100	1-16 mm
PTU-220125-160	SK40-ER25-160	42	44,45	160	1-16 mm
PTU-220132-70	SK40-ER32-70	50	44,45	70	2-20 mm
PTU-220132-100	SK40-ER32-100	50	44,45	100	2-20 mm
PTU-220132-160	SK40-ER32-160	50	44,45	160	2-20 mm
PTU-220140-80	SK40-ER40-80	63	44,45	80	3-26 mm
PTU-220140-100	SK40-ER40-100	63	44,45	100	3-26 mm
PTU-220140-160	SK40-ER40-160	63	44,45	160	3-26 mm
PTU-230116-70	SK50-ER16-70	32	69,85	70	1-10 mm
PTU-230116-100	SK50-ER16-100	32	69,85	100	1-10 mm
PTU-230116-160	SK50-ER16-160	32	69,85	160	1-10 mm
PTU-230125-60	SK50-ER25-60	42	69,85	60	1-16 mm
PTU-230125-100	SK50-ER25-100	42	69,85	100	1-16 mm
PTU-230125-160	SK50-ER25-160	42	69,85	160	1-16 mm
PTU-230132-70	SK50-ER32-70	50	69,85	70	2-20 mm
PTU-230132-100	SK50-ER32-100	50	69,85	100	2-20 mm
PTU-230132-160	SK50-ER32-160	50	69,85	160	2-20 mm
PTU-230140-80	SK50-ER40-80	50	69,85	80	3-26 mm
PTU-230140-100	SK50-ER40-100	50	69,85	100	3-26 mm
PTU-230140-160	SK50-ER40-160	50	69,85	160	3-26 mm

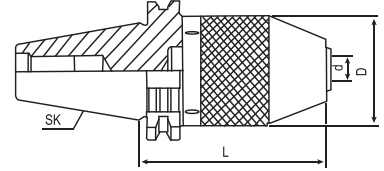


## MANDRENLİ TUTUCU APU (DIN 69871)

## SELF - FASTEN DRILL CHUCK

## Mandrenli Tutucu APU

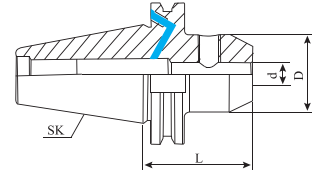
Sipariş Kodu	Model	d	D	L	
PTU-210608-80	SK30-APU8-80	1-8	37	80	
PTU-210613-120	SK30-APU13-120	1-13	50	120	
PTU-210616-130	SK30-APU16-130	3-16	54	130	
PTU-220613-100	SK40-APU13-100	1-13	50	100	
PTU-220616-115	SK40-APU16-115	3-16	54	115	
PTU-230613-100	SK50-APU13-100	1-13	50	100	
PTU-230616-105	SK50-APU16-105	3-16	54	105	



**SİLİNDİRİK ŞAFTLI VELDON TUTUCU DIN 6359 (DIN 69871)**  
**SIDE LOCK AND MILL HOLDER**

**DIN 6359**

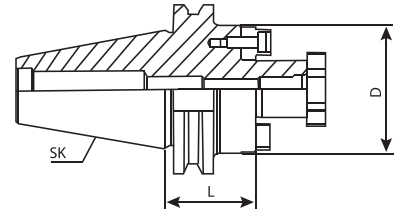
Sipariş Kodu	Model	Kapasite	D	L	
PTU-210806-50	SK30X6-50	6	25	50	
PTU-210808-50	SK30X8-50	8	28	50	
PTU-210810-50	SK30X10-50	10	35	50	
PTU-210812-50	SK30X12-50	12	42	50	
PTU-210814-63	SK30X14-63	14	44	63	
PTU-210816-63	SK30X16-63	16	48	63	
PTU-210818-63	SK30X18-63	18	48	63	
PTU-210820-70	SK30X20-70	20	52	70	
PTU-220806-50	SK40X6-50	6	25	50	
PTU-220808-50	SK40X8-50	8	28	50	
PTU-220810-50	SK40X10-50	10	35	50	
PTU-220812-50	SK40X12-50	12	42	50	
PTU-220814-50	SK40X14-50	14	44	50	
PTU-220816-63	SK40X16-63	16	48	63	
PTU-220818-63	SK40X18-63	18	48	63	
PTU-220820-63	SK40X20-63	20	52	63	
PTU-220825-100	SK40x25-100	25	65	100	
PTU-220832-100	SK40x32-100	32	72	100	
PTU-220832-160	SK40X32-160	32	72	160	
PTU-220840-120	SK40x40-120	40	80	120	
PTU-220840-160	SK40X40-160	40	80	160	
PTU-230806-63	SK50X6-63	6	25	63	
PTU-230808-63	SK50X8-63	8	28	63	
PTU-230810-63	SK50X10-63	10	35	63	
PTU-230812-63	SK50X12-63	12	42	63	
PTU-230814-63	SK50X14-63	14	44	63	
PTU-230816-63	SK50X16-63	16	48	63	
PTU-230818-63	SK50X18-63	18	48	63	
PTU-230820-63	SK50X20-63	20	52	63	
PTU-230825-80	SK50X25-80	25	65	80	
PTU-230832-100	SK50X32-100	32	72	100	
PTU-230840-100	SK50X40-100	40	90	100	



**ALIN TARAMA BAŞLIĞI MALAFASI - DIN 6357 (DIN 69871)  
FACE SELL MILL ARBOR**

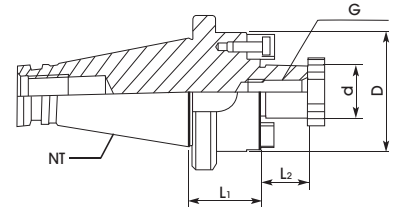
**DIN 6357**

Sipariş Kodu	Model	D	L	
PTU-210516-40	SK30-ATB16-40	16	38	
PTU-210522-40	SK30-ATB22-40	22	48	
PTU-210527-50	SK30-ATB27-50	27	58	
PTU-210532-50	SK30-ATB32-50	32	78	
PTU-220516-35	SK40-ATB16-35	16	38	
PTU-220516-100	SK40-ATB16-100	16	38	
PTU-220522-35	SK40-ATB22-35	22	48	
PTU-220522-100	SK40-ATB22-100	22	48	
PTU-220522-160	SK40-ATB22-160	22	48	
PTU-220527-40	SK40-ATB27-40	27	58	
PTU-220527-100	SK40-ATB27-100	27	58	
PTU-220532-50	SK40-ATB32-50	32	78	
PTU-220532-100	SK40-ATB32-100	32	78	
PTU-220540-50	SK40-ATB40-50	40	88	
PTU-220540-100	SK40-ATB40-100	40	88	
PTU-230522-35	SK50-ATB22-35	22	48	
PTU-230527-40	SK50-ATB27-40	27	58	
PTU-230532-50	SK50-ATB32-50	32	78	
PTU-230540-50	SK50-ATB40-50	40	88	



**DIN6357 - ISO**

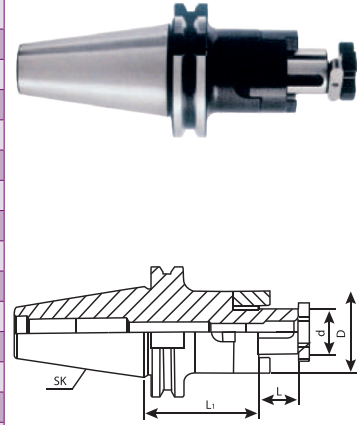
Sipariş Kodu	Model	D	L	
PTU-320516-30	ISO40-ATB16-30	38	30	
PTU-320522-30	ISO40-ATB22-30	48	30	
PTU-320527-30	ISO40-ATB27-30	58	30	
PTU-320532-30	ISO40-ATB32-30	69	30	
PTU-320540-30	ISO40-ATB40-30	80	30	



**KOMBİNE TARAMA BAŞLIĞI MALAFASI - DIN 6358 (DIN 69871)**  
**COMBI SHELL END MILL ARBOR**

**DIN 6358**

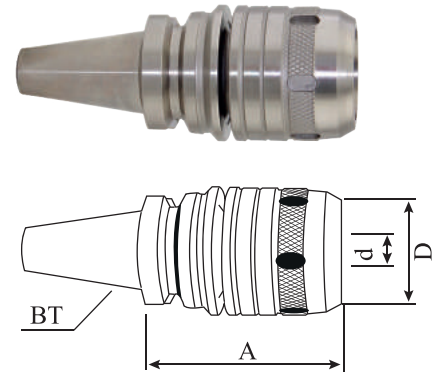
Sipariş Kodu	Model	d	L1	H	L
PTU-210416-50	SK30-KTB16-50	16	63	17	50
PTU-210422-50	SK30-KTB22-50	22	63	19	50
PTU-210427-55	SK30-KTB27-55	27	48	21	55
PTU-210432-60	SK30-KTB32-60	32	58	24	60
PTU-220416-55	SK40-KTB16-55	16	32	17	55
PTU-220416-100	SK40-KTB16-100	16	32	17	100
PTU-220422-55	SK40-KTB22-55	22	40	19	55
PTU-220422-100	SK40-KTB22-100	22	40	19	100
PTU-220427-55	SK40-KTB27-55	27	48	21	55
PTU-220427-100	SK40-KTB27-100	27	48	21	100
PTU-220432-60	SK40-KTB32-60	32	58	24	60
PTU-220432-100	SK40-KTB32-100	32	58	24	100
PTU-220440-60	SK40-KTB40-60	40	70	27	60
PTU-220440-100	SK40-KTB40-100	40	70	27	100
PTU-230416-55	SK50-KTB16-55	16	32	17	55
PTU-230416-55	SK50-KTB22-55	22	40	19	55
PTU-230416-55	SK50-KTB27-55	27	48	21	55
PTU-230416-55	SK50-KTB32-55	32	58	24	55
PTU-230416-55	SK50-KTB40-55	40	70	27	55



**RULMANLI TUTUCU - DIN 69871**  
**POWER MILLING CHUCK**

**Rulmanlı Tutucu**

Sipariş Kodu	Model	A	d	D
PTU-220325-100	SK40-C25-100	100	25	59
PTU-220332-105	SK40-C32-105	105	32	70
PTU-230332-110	SK50-C32-110	110	32	70



**Rulmanlı Tutucu ve Pens Seti**

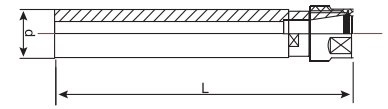
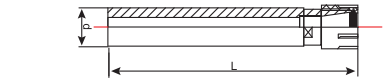
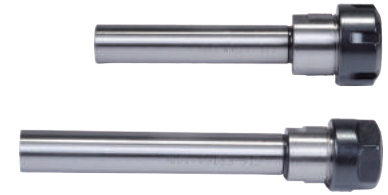
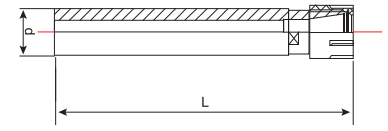
**Power Milling Chuck & collet set**

Sipariş Kodu	Model	A	d	D	Kapasite
PTU-220325-100S	SK40-C25-100 SET	100	25	59	6-20 mm
PTU-220332-135S	SK40-C32-135 SET	135	32	70	6-25 mm
PTU-230332-110S	SK50-C32-110 SET	110	32	70	6-25 mm

**SİLİNDİRİK ŞAFTLI TUTUCU DIN 6499**  
**STRAIGHT SHANK CHUCK**

**DIN 6499**

Sipariş Kodu	Model	d	L	Kapasite
PTU-410108-100M	C8-ER8M-100 (Mini Kapak)	8	100	1-5mm
PTU-410108-150M	C8-ER8M-150 (Mini Kapak)	8	150	1-5mm
PTU-420108-100M	C10-ER8M-100 (Mini Kapak)	10	100	1-5mm
PTU-420108-150M	C10-ER8M-150 (Mini Kapak)	10	150	1-5mm
PTU-420108-180M	C10-ER8M-180 (Mini Kapak)	10	180	1-7mm
PTU-420111-100M	C10-ER11M-100 (Mini Kapak)	10	100	1-7mm
PTU-420111-150M	C10-ER11M-150 (Mini Kapak)	10	150	1-5mm
PTU-430108-100M	C12-ER8M-100 (Mini Kapak)	12	100	1-5mm
PTU-430108-150M	C12-ER8M-150 (Mini Kapak)	12	150	1-5mm
PTU-430111-50M	C12-ER11M-50 (Mini Kapak)	12	50	1-7mm
PTU-430111-100M	C12-ER11M-100 (Mini Kapak)	12	100	1-7mm
PTU-430111-150M	C12-ER11M-150 (Mini Kapak)	12	150	1-7mm
PTU-440111-50M	C16-ER11M-50 (Mini Kapak)	16	50	1-7mm
PTU-440111-100M	C16-ER11M-100 (Mini Kapak)	16	100	1-7mm
PTU-440111-150M	C16-ER11M-150 (Mini Kapak)	16	150	1-7mm
PTU-440116-50M	C16-ER16M-50 (Mini Kapak)	16	50	1-10mm
PTU-440116-100M	C16-ER16M-100 (Mini Kapak)	16	100	1-10mm
PTU-440116-150M	C16-ER16M-150 (Mini Kapak)	16	150	1-10mm
PTU-450116-100M	C20-ER16M-100 (Mini Kapak)	20	100	1-10mm
PTU-450116-150M	C20-ER16M-150 (Mini Kapak)	20	150	1-10mm
PTU-450116-200M	C20-ER16M-200 (Mini Kapak)	20	200	1-10mm
PTU-450116-250M	C20-ER16M-250 (Mini Kapak)	20	250	1-10mm
PTU-450120-100M	C20-ER20M-100 (Mini Kapak)	20	100	1-13mm
PTU-450120-150M	C20-ER20M-150 (Mini Kapak)	20	150	1-13mm
PTU-450120-200M	C20-ER20M-200 (Mini Kapak)	20	200	1-13mm
PTU-450120-250M	C20-ER20M-250 (Mini Kapak)	20	250	1-13mm
PTU-450120-300M	C20-ER20M-300 (Mini Kapak)	20	300	1-13mm
PTU-450125-50M	C20-ER25M-50 (Mini Kapak)	20	50	1-16mm
PTU-450125-100M	C20-ER25M-100 (Mini Kapak)	20	100	1-16mm
PTU-450125-150M	C20-ER25M-150 (Mini Kapak)	20	150	1-16mm
PTU-450125-200M	C20-ER25M-200 (Mini Kapak)	20	200	1-16mm
PTU-450125-250M	C20-ER25M-250 (Mini Kapak)	20	250	1-16mm
PTU-460125-100M	C25-ER25M-100 (Mini Kapak)	25	100	1-16mm
PTU-460125-150M	C25-ER25M-150 (Mini Kapak)	25	150	1-16mm
PTU-460125-200M	C25-ER25M-200 (Mini Kapak)	25	200	1-16mm
PTU-460125-250M	C25-ER25M-250 (Mini Kapak)	25	250	1-16mm
PTU-460132-100UM	C25-ER32UM-100	25	100	2-20mm
PTU-460132-150UM	C25-ER32UM-150	25	150	2-20mm
PTU-460140-100UM	C25-ER40UM-100	25	100	3-26mm
PTU-460140-150UM	C25-ER40UM-150	25	150	3-26mm
PTU-470125-100UM	C32-ER25UM-100	32	100	1-16mm
PTU-470125-150UM	C32-ER25UM-150	32	150	1-16mm
PTU-470132-100UM	C32-ER32UM-100	32	100	2-20mm
PTU-470132-150UM	C32-ER32UM-150	32	150	2-20mm
PTU-470140-100UM	C32-ER40UM-100	32	100	3-26mm
PTU-470140-150UM	C32-ER40UM-150	32	150	3-26mm
PTU-480132-100UM	C40-ER32UM-100	40	100	2-20mm
PTU-480132-150UM	C40-ER32UM-150	40	150	2-20mm
PTU-480140-100UM	C40-ER40UM-100	40	100	3-26mm
PTU-480140-150UM	C40-ER40UM-150	40	150	3-26mm





**SİLİNDİRİK ŞAFTLI EMNİYETLİ KILAVUZ ÇEKME BAŞLIĞI**  
**STRAIGHT SHANK TAPPING CHUCK**

**Silindirik Şaftlı Emniyetli Kılavuz Çekme Başlığı**

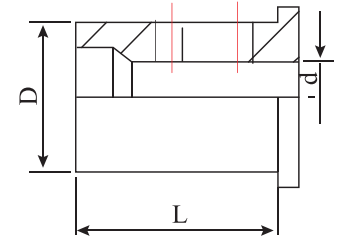
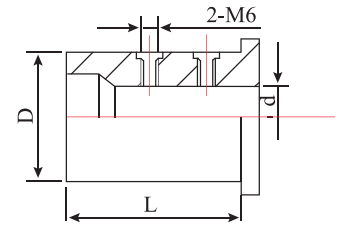
Sipariş Kodu	Model	L	D
PTU-461214	C25-M2-M14	57	25
PTU-461224	C25-M5-M24	57	25
PTU-471214	C32-M2-M14	61	32
PTU-471224	C32-M5-M24	61	32
PTU-481214	C40-M2-M14	71	40
PTU-481224	C40-M5-M24	71	40



**REDÜKSİYON KOVANI**  
**REDUCTION SLEEVE**

**Redüksiyon Kovanı**

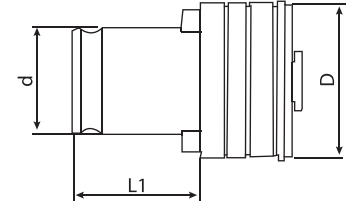
Sipariş Kodu	Model	d	D	L
PAK-072506	25x6	6	25	46
PAK-072508	25x8	8	25	46
PAK-072510	25x10	10	25	46
PAK-072512	25x12	12	25	46
PAK-072516	25x16	16	25	46
PAK-072520	25x20	20	25	46
PAK-073206	32x6	6	32	56
PAK-073208	32x8	8	32	56
PAK-073210	32x10	10	32	56
PAK-073212	32x12	12	32	56
PAK-073216	32x16	16	32	56
PAK-073220	32x20	20	32	56
PAK-073225	32x25	25	32	56
PAK-074006	40x6	6	40	71
PAK-074008	40x8	8	40	71
PAK-074010	40x10	10	40	71
PAK-074012	40x12	12	40	71
PAK-074016	40x16	16	40	71
PAK-074020	40x20	20	40	71
PAK-074025	40x25	25	40	71
PAK-074032	40x32	32	40	71
PAK-075006	50x6	6	50	75
PAK-075008	50x8	8	50	75
PAK-075010	50x10	10	50	75
PAK-075012	50x12	12	50	75
PAK-075016	50x16	16	50	75
PAK-075020	50x20	20	50	75
PAK-075025	50x25	25	50	75
PAK-075032	50x32	32	50	75
PAK-075040	50x40	40	50	75



EMNİYETLİ KILAVUZ TUTUCU  
TORSION TAPPING COLLET

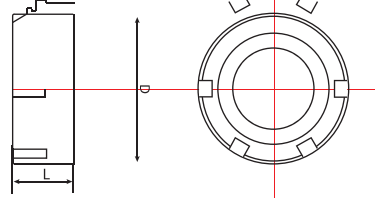
## Emniyetli Kılavuz Tutucu

Sipariş Kodu	Model	d	D	L1	
PTU-53519-03	M3-3,5x19	19	33	25	
PTU-54519-04	M4-4,5x19	19	33	25	
PTU-50619-05	M5-6x19	19	33	25	
PTU-50619-06	M6-6x19	19	33	25	
PTU-50819-08	M8-8x19	19	33	25	
PTU-51019-10	M10-10x19	19	33	25	
PTU-50919-12	M12-9x19	19	33	25	
PTU-51119-14	M14-11x19	19	33	25	
PTU-50631-05	M5-6x31	31	50,6	31	
PTU-50631-06	M6-6x31	31	50,6	31	
PTU-50831-08	M8-8x31	31	50,6	31	
PTU-50731-10	M10-7x31	31	50,6	31	
PTU-51031-10	M10-10x31	31	50,6	31	
PTU-50931-12	M12-9x31	31	50,6	31	
PTU-51131-14	M14-11x31	31	50,6	31	
PTU-51231-16	M16-12x31	31	50,6	31	
PTU-51431-18	M18-14x31	31	50,6	31	
PTU-51631-20	M20-16x31	31	50,6	31	
PTU-51631-22	M22-16x31	31	50,6	31	
PTU-51631-24	M24-16x31	31	50,6	31	
PTU-51148-14	M14-11x48	48	73	41	
PTU-51248-16	M16-12x48	48	73	41	
PTU-51448-18	M18-14x48	48	73	41	
PTU-51648-20	M20-16x48	48	73	41	
PTU-51848-22	M22-18x48	48	73	41	
PTU-51848-24	M24-18x48	48	73	41	
PTU-52048-27	M27-20x48	48	73	41	
PTU-52248-30	M30-22x48	48	73	41	
PTU-52548-33	M33-25x48	48	73	41	
PTU-52848-36	M36-28x48	48	73	41	



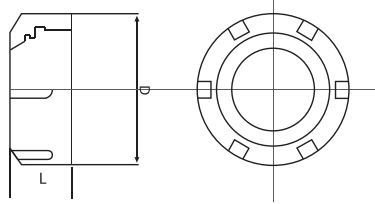
**ER KAPAKLAR**

**ER NUTS**



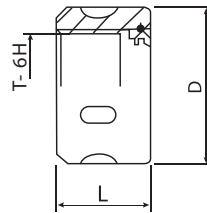
**ER Mini Kapak - ER Mini Nut**

Sipariş Kodu	Model	L	D	Diş Ölçüsü	Kapasite
PAK-022-08M	ER8	12	12	M10 x 0.75	1-5 mm
PAK-022-11 M	ER11	12	16	M13 X 0.75	1-7 mm
PAK-022-16M	ER16	18	22	M19 x 1	2-10 mm
PAK-022-20M	ER20	19	28	M24 X 1	2-13 mm



**ER UM Kapak - ER UM Nut**

Sipariş Kodu	Model	L	D	Diş Ölçüsü	Kapasite
PAK-022-16UM	ER16 UM	17	32	M22 x 1.5	2-10 mm
PAK-022-20UM	ER20 UM	19	35	M25 x 1.5	2-13 mm
PAK-022-25UM	ER25 UM	20	42	M32x1.5	2-16mm
PAK-022-32UM	ER32 UM	22,5	50	M40 x 1.5	3-20 mm
PAK-022-40UM	ER40 UM	25,5	63	M50 x 1.5	4-26 mm

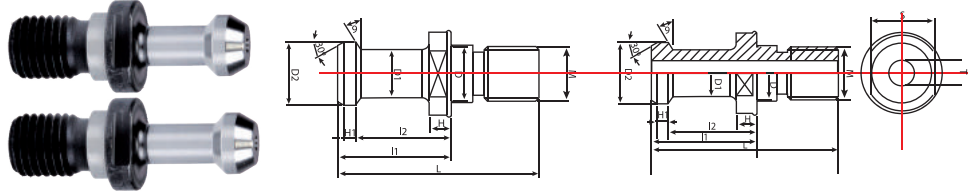


**OZ Kapak - OZ Nut**

Sipariş Kodu	Model	L	D	Diş Ölçüsü
PAK-021-462	OZ25 (462)	24	43	M33X1.5
PAK-021-467	OZ32 (467)	30	60	M48X2

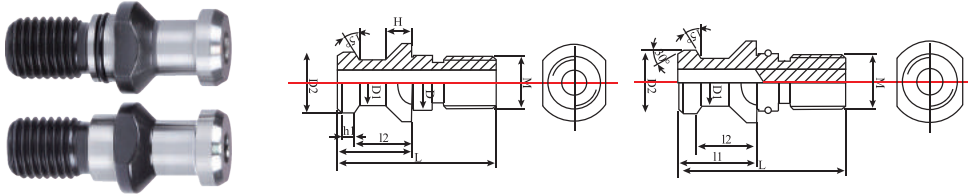
**ÇEKTİRME CİVATASI**

**RETENTION KNUB - PULLSTUD**



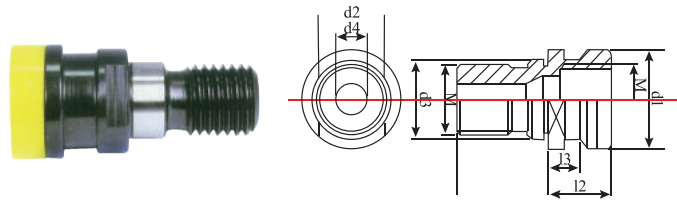
**JIS B 6339 (MAS 403 BT)**

Sipariş Kodu	Model	L	D	Diş Ölçüsü	Kapasite
PAK-032-301245	BT30-M 12 x 45	44	45	M12	BT30
PAK-032-301245IS	BT30-M 12 x 45	44	45	M12	BT30
PAK-032-401645	BT40-M16 x 45	54	45	M16	BT40
PAK-032-401645IS	BT40-M16 x 45	54	45	M16	BT40
PAK-032-502445	BT50-M24 x 45	74	45	M24	BT50
PAK-032-502445IS	BT50-M24 x 45	74	45	M24	BT50



**DIN 69871**

Sipariş Kodu	Model	L	D	Diş Ölçüsü	Kapasite
PAK-031-301245	SK30-M 12 x 45	44	45	M12	SK30
PAK-031-301245IS	SK30-M12 x 45	44	45	M12	SK30
PAK-031-401645	SK40-M 16 x 45	54	45	M16	SK40
PAK-031-401645IS	SK40-M16 x 45	54	45	M16	SK40
PAK-031-502445	SK50-M24 x 45	74	45	M24	SK50
PAK-031-502445IS	SK50-M24 x 45	74	45	M24	SK50



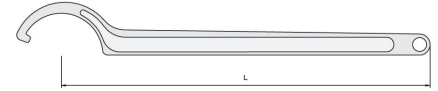
**DIN 2080**

Sipariş Kodu	Model	L	D	Kapasite
PAK-033-4016	M16	53	25	SK40
PAK-033-5024	M24	65	40	SK50

ANAHTARLAR  
SPANNERS

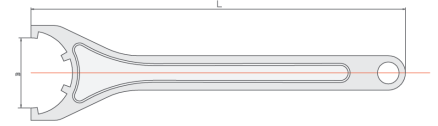
## Ay Anahtarı - OZ Spanner

Sipariş Kodu	Model	L	Kapasite	
PAK-011-462	45-52	190	45-52	
PAK-011-467	55-62	210	55-62	



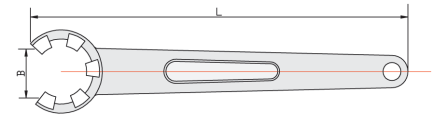
## ER UM Anahtar - ER UM Spanner

Sipariş Kodu	Model	L	B	Kapasite	
PAK-012-25UM	ER25	168	37	ER25	
PAK-012-32UM	ER32	190	45	ER32	
PAK-012-40UM	ER40	210	58	ER40	



## ER Mini Anahtar - ER Mini Spanner

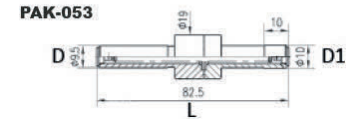
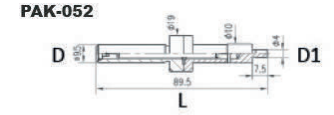
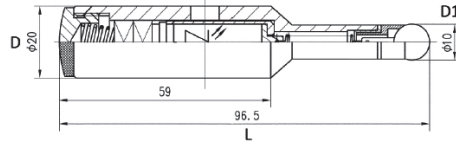
Sipariş Kodu	Model	L	B	Kapasite	
PAK-012-08M	ER8M	70	7,5	ER8 Mini	
PAK-012-11M	ER11M	90	11	ER11 Mini	
PAK-012-16M	ER16M	110	15	ER16 Mini	
PAK-012-20M	ER20M	120	19,5	ER20 Mini	
PAK-012-25M	ER25M	130	25	ER25 Mini	



TAKIM SIFIRLAMA PROBLARI  
TOOL SETTINGS PROBS

## Işıklı &amp; Sesli ve Mekanik Prob

Sipariş Kodu	Model	L	D	D1	
PAK-051	Işıklı & Sesli Prob	96,5	20	10	
PAK-052	Mekanik Prob İnce	89,5	9,5	4	
PAK-052K	Mekanik Prob İnce (Kaplama)	89,5	9,5	4	
PAK-053	Mekanik Prob Kalın	82,5	9,5	10	
PAK-053K	Mekanik Prob Kalın (Kaplama)	82,5	9,5	10	



## MONTAJ APARATI

## VERTICAL AND HORIZONTAL TOOL HOLDER DEVICE

## Montaj Aparatı

Sipariş Kodu	Model	L	H	B	
PAK-041-30	BT30	127	75	47	
PAK-041-40	BT40	160	105	62	
PAK-041-50	BT50	180	155	99	

Z SIFIRLAMA  
ZERO SETTER

## Z Sıfırlama

Sipariş Kodu	Model	L	D	
PAK-081-50	50 mm	56	57	



TAKIM DOLAPLARI  
TOOL CABINETS

## Takım Dolapları

Sipariş Kodu	Model	Kapasite	
PTD-50120	Döner Takım Dolabı	120 Çekmeceli	
PTD-15945	Takım Arabası	5 Çekmeceli	
PTD-44015	Mors Tutucu Sehpası	BT40, 15 Delikli	
PTD-45012	Mors Tutucu Sehpası	BT50, 12 Delikli	
PTD-60001	Çekmece İçi Seperatör		







**PRO-X**



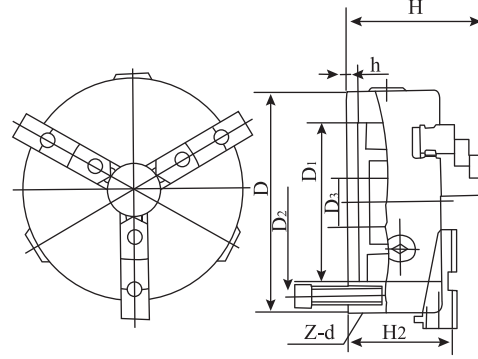
**6**

TORNA AYNALARI  
LATHE CHUCKS

# TORNA AYNALARI LATHE CHUCKS

**3 AYAKLI TORNA AYNASI**

**3 JAW SELF - CENTERING CHUCK**

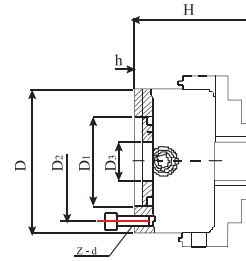
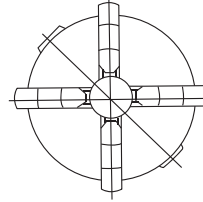


**Standart Seri**

Sipariş Kodu	Ölçü	D1	D2	D3	H	h	z-d	Max Devir	Max Hız
PTA-1080	80 mm	55	66	16	66	3,5	3-M6	40	4800
PTA-1100	100 mm	72	84	22	74,5	3,5	3-M8	60	4200
PTA-1125	125 mm	95	108	30	84	4	3-M8	100	3800
PTA-1160	160 mm	130	142	45	95	5	3-M8	160	3600
PTA-1200	200 mm	165	180	65	109	5	3-M10	250	3000
PTA-1250	250 mm	206	226	80	120	5	3-M12	320	2400
PTA-1315	315 mm	260	285	100	136	6	3-M16	400	1800
PTA-1400	400 mm	340	368	145	154	6	3-M16	500	1200
PTA-1500	500 mm	440	465	210	175	6	6-M16	630	850
PTA-1630	630 mm	560	595	270	218	7	6-M16	800	600

**4 AYAKLI TORNA AYNASI**

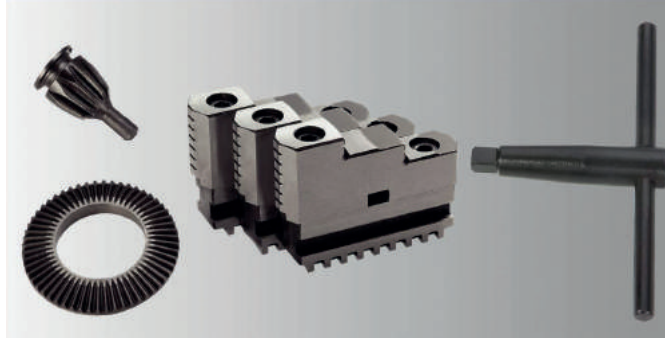
**4 JAW SELF - CENTERING CHUCK**



**Standart Seri**

Sipariş Kodu	Ölçü	D1	D2	D3	H	h	z-d	Max Devir	Max Hız
PTA-2080	80 mm	55	66	16	66	3,5	3-M6	25	4000
PTA-2100	100 mm	72	84	22	74,5	3,5	3-M8	30	3500
PTA-2125	125 mm	95	108	30	84	4	3-M8	50	3000
PTA-2160	160 mm	130	142	45	95	5	3-M8	70	2500
PTA-2200	200 mm	165	180	65	109	5	3-M10	100	2000
PTA-2250	250 mm	206	226	80	120	5	3-M12	150	1600
PTA-2315	315 mm	260	285	100	136	6	3-M16	180	1200
PTA-2400	400 mm	340	368	145	154	6	3-M16	280	1000
PTA-2500	500 mm	440	465	210	175	6	3-M16	350	800

**YEDEK PARÇALAR  
SPARE PARTS**



**Yedek Ayak (3 Ayaklı)**

**Spare Jaw (3 Jaw Chuck)**

Sipariş Kodu	Ölçü	
PTA-1080AD	80 mm	
PTA-1080AT	80 mm	
PTA-1100AD	100 mm	
PTA-1100AT	100 mm	
PTA-1125AD	125 mm	
PTA-1125AT	125 mm	
PTA-1160AD	160 mm	
PTA-1160AT	160 mm	
PTA-1200AD	200 mm	
PTA-1200AT	200 mm	
PTA-1250AD	250 mm	
PTA-1250AT	250 mm	
PTA-1315AD	315 mm	
PTA-1315AT	315 mm	
PTA-1400AD	400 mm	
PTA-1400AT	400 mm	

**Yedek Ayak (4 Ayaklı)**

**Spare Jaw (4 Jaw Chuck)**

Sipariş Kodu	Ölçü	
PTA-2080AD	80 mm	
PTA-2080AT	80 mm	
PTA-2100AD	100 mm	
PTA-2100AT	100 mm	
PTA-2125AD	125 mm	
PTA-2125AT	125 mm	
PTA-2160AD	160 mm	
PTA-2160AT	160 mm	
PTA-2200AD	200 mm	
PTA-2200AT	200 mm	
PTA-2250AD	250 mm	
PTA-2250AT	250 mm	
PTA-2315AD	315 mm	
PTA-2315AT	315 mm	
PTA-2400AD	400 mm	
PTA-2400AT	400 mm	

**Pinyon**

**Screw Pinion**

Sipariş Kodu	Ölçü	
PTA-1080P	80 mm	
PTA-1100P	100 mm	
PTA-1125P	125 mm	
PTA-1160P	160 mm	
PTA-1200P	200 mm	
PTA-1250P	250 mm	
PTA-1315P	315 mm	
PTA-1400P	400 mm	

**Salyangoz Dişlisi**

**Scroll / Parcel**

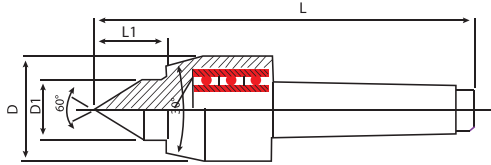
Sipariş Kodu	Ölçü	
PTA-1080S	80 mm	
PTA-1100S	100 mm	
PTA-1125S	125 mm	
PTA-1160S	160 mm	
PTA-1200S	200 mm	
PTA-1250S	250 mm	
PTA-1315S	315 mm	
PTA-1400S	400 mm	

**Anahtar**

**Key**

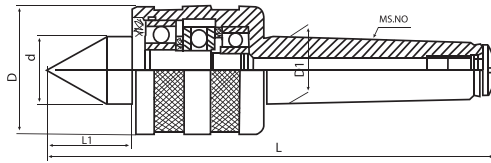
Sipariş Kodu	Ölçü	
PTA-1080K	80 mm	
PTA-1100K	100 mm	
PTA-1125K	125 mm	
PTA-1160K	160 mm	
PTA-1200K	200 mm	
PTA-1250K	250 mm	
PTA-1315K	315 mm	
PTA-1400K	400 mm	

**DÖNER PUNTALAR  
CENTERS**



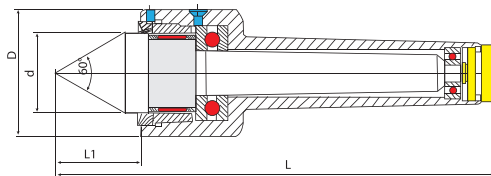
**Standart Tip - Standart Type**

Sipariş Kodu	Ölçü	D	d	L1	L	Max Hız	Hassasiyet
PPU-3108	MK1	32	16	21	108	4000	0.005
PPU-3132	MK2	40	22	26	132	4000	0.005
PPU-3164	MK3	45	26	32	164	4000	0.005
PPU-3188	MK4	48	30	34	188	4000	0.005
PPU-3248	MK5	68	45	50	248	3500	0.005



**Orta Hız - Medium Speed**

Sipariş Kodu	Ölçü	D	d	L1	L	Max Yük	Max Hız	Hassasiyet
PPU-1115	MK1	34	18	20	115	900	5000	0,01
PPU-1145	MK2	45	25	26	145	1500	5000	0,01
PPU-1170	MK3	52	28	30	170	2000	4200	0,01
PPU-1205	MK4	60	32	34,7	206	3200	3200	0,01
PPU-1254	MK5	77	45	45	254	3600	1000	0,015
PPU-1362	MK6	125	75	68,5	362	10000	800	0,015



**Yüksek Hız - High Speed**

Sipariş Kodu	Ölçü	D	d	L1	L	Max Yük	Max Hız	Hassasiyet
PPU-2125	MK2	36	22	25,5	125	340	6000	0,005
PPU-2162	MK3	47	30	32	162	400	5000	0,005
PPU-2194	MK4	55	35	37,5	194	1300	3500	0,005
PPU-2240	MK5	70	45	47	240	2000	3500	0,005



**PRO-X**



**7**

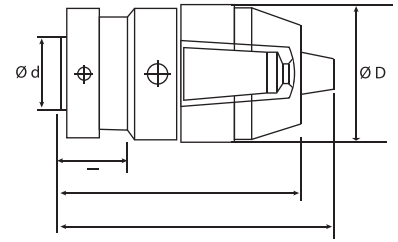
# MANDRENLER KEYLESS CHUCKS

**7**  
MANDRENLER  
KEYLESS CHUCKS

**MANDRENLER VE ANAHTARLAR  
KEYLESS CHUCKS AND KEYS**

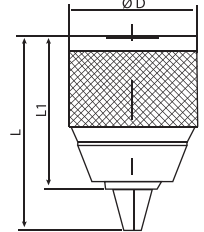
**Elle Sıkma Mandren - Self-Tighten Chuck**

Sipariş Kodu	Ölçü	D	d	l	Kapasite
PMN-1050610	0,5-6mm/B10	34	10,08	71,2	0,5-6 mm
PMN-1050812	0,5-8mm/B12	34	12,06	71,2	0,5-8 mm
PMN-1011012	1-10mm/B12	36	12,06	78	1-10 mm
PMN-1011316	1-13mm/B16	48	15,73	84,5	1-13 mm
PMN-1011616	1-16mm/B16	54	17,78	103	1-16 mm
PMN-1011618	1-16mm/B18	54	17,78	103	1-16 mm
PMN-1052022	5-20mm/B22	58	21,78	124,2	5-20 mm



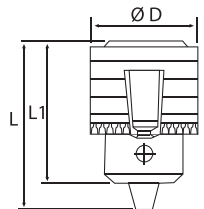
**Otomatik Kilitlemeli Mandren (Metal Gövde)  
Keyless Chuck with Lock System (Metal Body)**

Sipariş Kodu	Ölçü	D	d	Kapasite
PMN-2021320	2-13mm / 1/2-20UNF	43	75	2-13mm



**Anahtarlı Mandren Ağır Tip  
Key Type Chuck (Heavy Duty)**

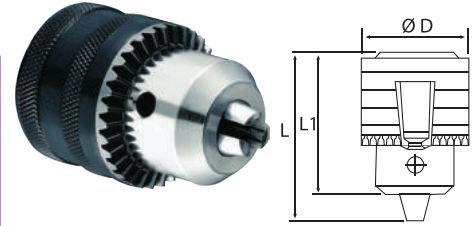
Sipariş Kodu	Ölçü	D	L	Kapasite
PMN-3011316	1-13mm/816	53,2	67	1-13 mm
PMN-3031616	3-16mm/816	53,2	86	3-16 mm
PMN-3031618	3-16mm/818	53,2	86	3-16 mm
PMN-3011616	1-16mm/816	58	84,3	1-16 mm
PMN-3011618	1-16mm/818	58	84,3	1-16 mm
PMN-3052022	5-20mm / 822	74	126	5-20 mm
PMN-4502524	5-25mm / 824	83,3	146	5-25 mm





**Anahtarlı Mandren Hafif Tip****Key Type Chuck (Light Duty)**

Sipariş Kodu	Ölçü	D	L	Kapasite (mm)	
PMN-5151024	1.5-10MM 3/8-24UNF	34	58,5	1.5-10	
PMN-5151020	1.5-10MM 1/2-20UNF	34	58,5	1.5-10	
PMN-5151324	1.5-13MM 3/8-24UNF	42	71,5	1.5-13	
PMN-5151320	1.5-13MM 1/2-20UNF	42	71,5	1.5-13	
PMN-5031620	3-16MM 1/2-20UNF	52	86	3-16	
PMN-5031616	3-16MM B16	52	86	3-16	
PMN-5031618	3-16MM B18	52	86	3-16	

**Mandren Anahtarı****Drill Chuck Key**

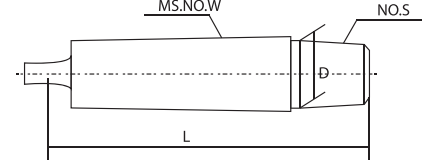
Sipariş Kodu	Ölçü	D	L	
PMN-MA16	13-16mm	6	80	
PMN-MA20	20mm	6	110	



**MORS KONİK & KOVANLAR  
TAPER SLEEVES & ARBORS**

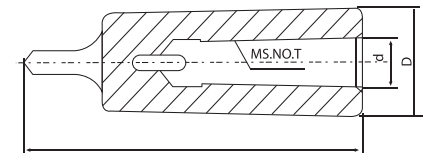
**Mors Konik - Arbor**

Sipariş Kodu	Ölçü	D	L	
PKO-1110	MK1-B10	10,09	84	
PKO-1112	MK1-B12	12,06	88	
PKO-1210	MK2-B10	10,09	97	
PKO-1212	MK2-B12	12,06	101	
PKO-1216	MK2-B16	15,73	107	
PKO-1222	MK2-B22	21,79	124	
PKO-1310	MK3-B10	10,09	116	
PKO-1312	MK3-B12	12,06	120	
PKO-1316	MK3-B16	15,73	126	
PKO-1318	MK3-B18	17,78	134	
PKO-1322	MK3-B22	21,79	143	
PKO-1324	MK3-B24	23,82	153	
PKO-1412	MK4-B12	12,06	145	
PKO-1416	MK4-B16	15,73	151	
PKO-1418	MK4-B18	17,78	159	
PKO-1422	MK4-B22	21,79	167	
PKO-1516	MK5-B16	23,82	184	
PKO-1518	MK5-B18	17,78	192	
PKO-1522	MK5-B22	21,79	200	
PKO-1524	MK5-B24	23,82	210	

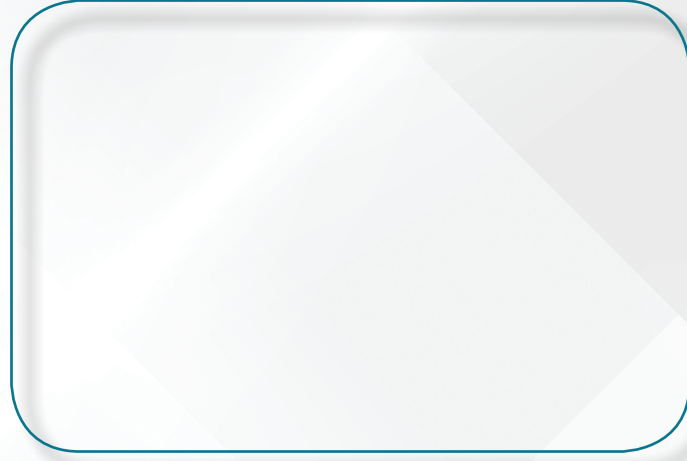


**Mors Kovan - Taper Sleeve**

Sipariş Kodu	Ölçü	D	L	
PKO-2021	2x1	18,6	92	
PKO-2031	3x1	24,1	99	
PKO-2032	3x2	24,7	112	
PKO-2041	4x1	31,6	124	
PKO-2042	4x2	31,6	124	
PKO-2043	4x3	32,4	140	
PKO-2051	5x1	44,7	156	
PKO-2052	5x2	44,7	156	
PKO-2053	5x3	44,7	156	
PKO-2054	5x4	45,5	171	
PKO-2061	6x1	63,8	218	
PKO-2062	6x2	63,8	218	
PKO-2063	6x3	63,8	218	
PKO-2064	6x4	63,8	218	
PKO-2065	6x5	63,8	218	







**PRO-X**

**Kesici Takımlar Katalođu**

**2018**