Teknisyenler için yeni ürünler

NEW

MaxiMill Slot-SX



→ Sayfa 126–141

SX kanal açma sisteminin SX kesici uçlarına sahip yeni disk freze sistemi

---

NEW

MaxiMill 242



→ Sayfa 90

Pah frezesi güncellemesi

NEW

MaxiMill 490



→ Sayfa 78+80

Ayarlanabilir açılı frezesi güncellemesi

NEW

CTPX715



yeni geniş kapsamlı kalite

NEW

MaxiMill 273-08



→ Sayfa 35+36

NEW

MaxiMill 252



→ Sayfa 115+116



Dolu malzeme delme ve delik işleme

1 HSS Matkaplar

2 Karbür Matkaplar

3 Takma Uçlu Matkaplar

4 Raybalar ve havşa matkapları

5 Delik işleme takımları

Diş açma

6 Kılavuzlar ve ovalama kılavuzları

7 Diş açma frezeleri

8 Diş açma

Tornalama

9 Tornalama Takımları

10 Multi Fonksiyonel Takımlar – EcoCut ve FreeTurn

11 Kesme ve Kanal Açma Takımları

12 UltraMini + MiniCut

Frezeleme

13 HSS-Frezeler

14 Karbür Frezeler

15 Takma uçlu freze takımlar **15**

Bağlama Teknikleri

16 Tutucular ve Aksesuarlar

17 İş parçası bağlama

18 Malzeme örnekleri ve malzeme no listesi

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CERATIZIT \ Performance

En yüksek performans için üstün kaliteli ürün.

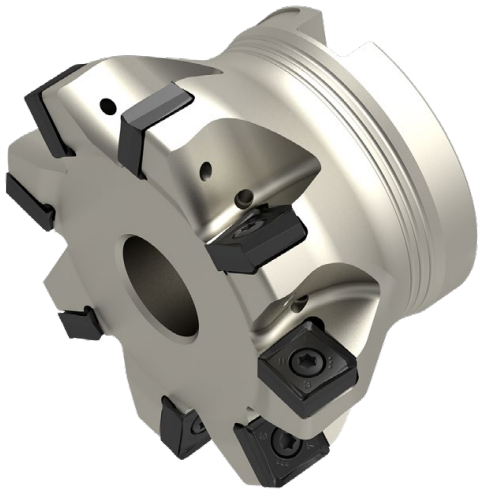
CERATIZIT Performance grubundaki üstün kaliteli ürünler özel kullanım için üretilmiştir ve üstün performans yakalamanızı sağlar. Eğer sizde üretiminizde üretim performansı isteğiniz ve çok iyi sonuçlar elde etmek istiyorsanız, **CERATIZIT Performance** grubundaki üstün kaliteli ürünleri tavsiye ederiz.

Sembol açıklaması


Merkezi içten soğutma


Yanal içten soğutma

κ = 43°
Kesme kenarı açısı



ZNF = Ağız sayısı

● = **Ana uygulama**

○ = Ek uygulamalar

Uygulama sembolleri


Yüzey frezeleme


Açılı frezeleme (Rampa)


Helisel dalma


Eksenel dalma


Eksenel yönde frezeleme


Kanal freze


Köşe frezeleme


Kanal frezeleme (45°)


Pah frezeleme

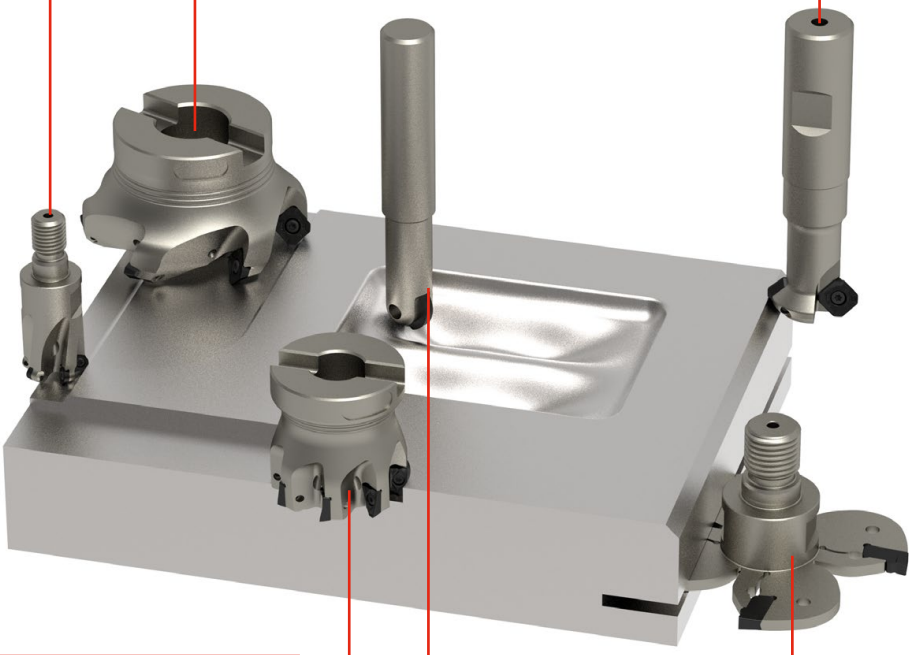

Serbest form frezeler

Toolfinder – Uygulamalar için seçim klavuzu

kalıp frezeleme
→ sistem seçimi:
10+11

Yüzey frezeleme
→ sistem seçimi:
6+7

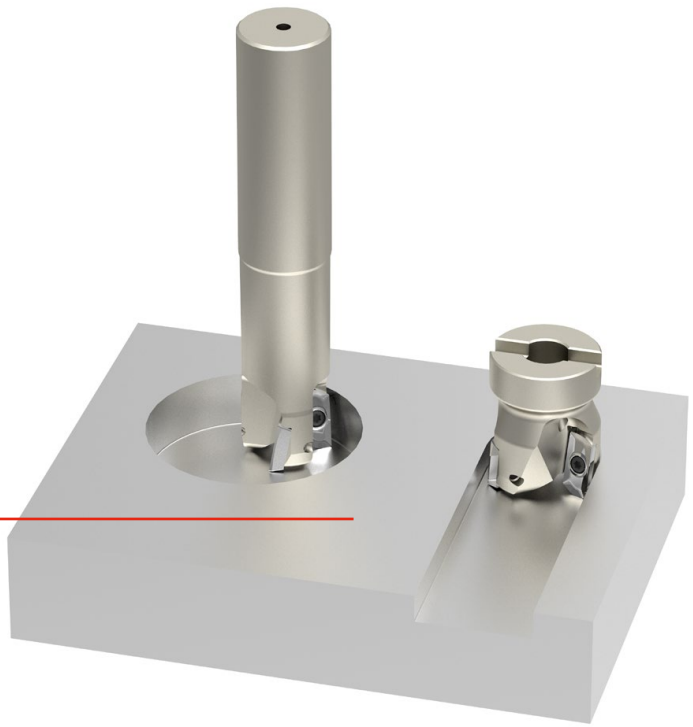
Pah / açı frezeleme
→ sistem seçimi:
12



Köşe frezeleme
→ sistem seçimi:
8+9

Kesme ve kanal frezeleme
→ sistem seçimi:
12

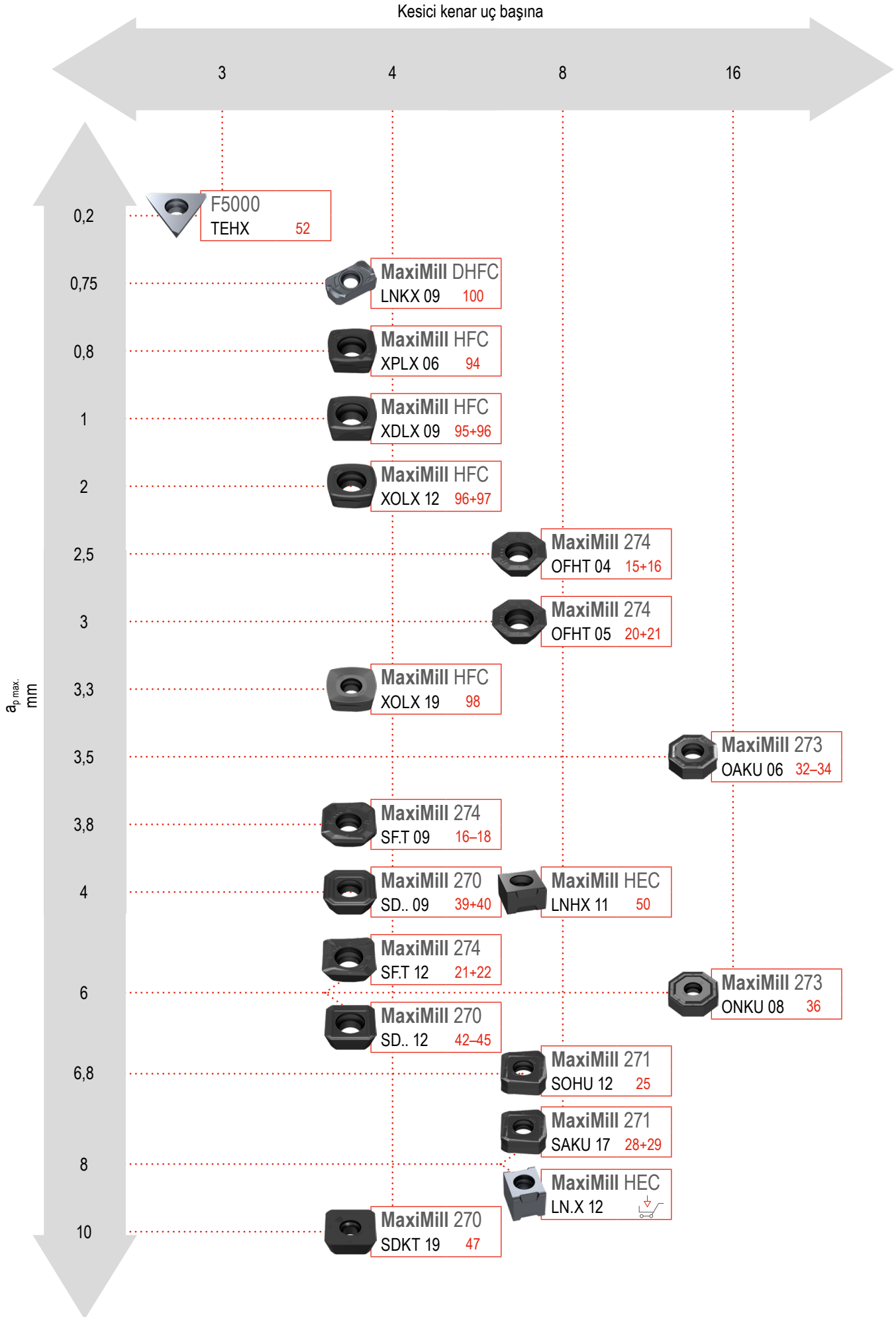
kalıp frezeleme
→ sistem seçimi:
10+11



HSC/HPC Frezeler
→ sistem seçimi:
8+9

15

Toolfinder – yüzey frezeleme



İçindekiler – yüzey frezeleme

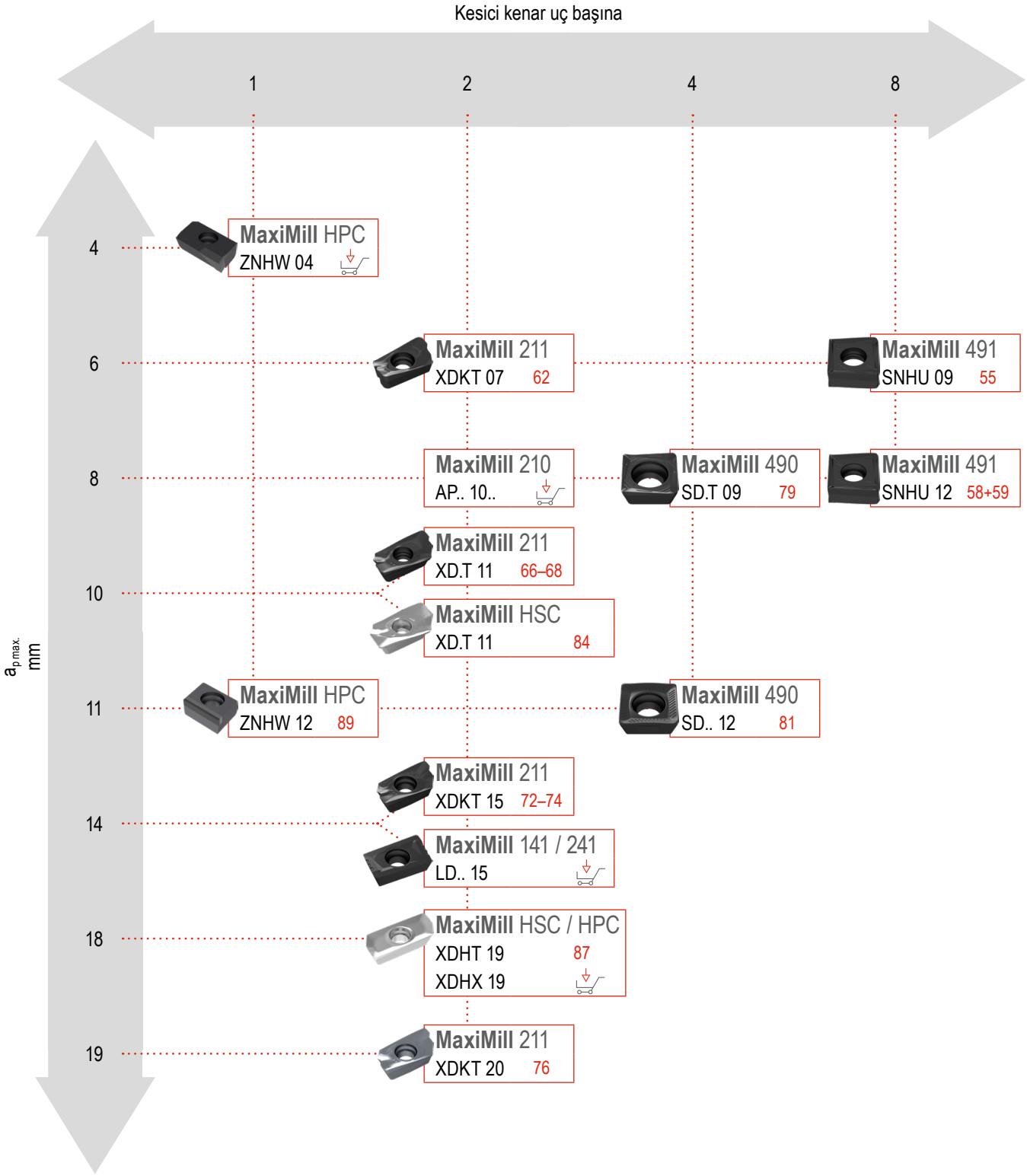
Sistem	Takma Uç	Kesici kenar uç başına	$a_{p\,max.}$ mm	Ø-Çap Aralığı mm			Çelik	Paslanmaz çelik	Dökme demir	Demir dışı metaller	Isıya dayanıklı alaşımlar	Sertleştirilmiş malzemeler	Metal dışı malzemeler	Sayfa
MaxiMill 274	**OFH.** 04.. / 05.. | **SF.T** 09.. / 12..	8 | 4	2,5–6	Ø 20–32	Ø 20–32	Ø 32–160	●	●	●	●	●		○	13–22
MaxiMill 271	**SOHU** 1204.. | **SAKU** 1706..	8	6,8 | 8,4		Ø 32–40	Ø 40–250	●	●	●		●			23–29
MaxiMill 273	**OAKU** 0605.. | **ONKU** 0806..	16	3,5 | 6			Ø 40–250	●	●	●		●			30–36
MaxiMill 270	**SD..** 0903.. / 1204.. / 19..	4	4–10		Ø 6–32	Ø 32–315	●	●	●	●	●			37–47
MaxiMill HEC	**LNHX** 1106..	8	4–8			Ø 50–160	●		●				○	48–50
MaxiMill HEC	**LN.X** 1210..	8	4–8			Ø 125–160		●						
F 5000	**TEHX** 16T3..	3	0,2			Ø 42–100	●	●	●			●		51+52
MaxiMill HFC	**X..X** 06.. / 09.. / 12.. / 19..	4	0,8–3,3	Ø 16–42	Ø 16–35	Ø 32–160	●	●	●		●			92–98
MaxiMill DHFC	**LNKX** 09..	4	0,75	Ø 16–42	Ø 16–20		●	●	●		○			99+100

Diğer çaplar istek üzerine temin edilebilir.

Artık listelenmeyen sistemler için takma uçları cuttingtools.ceratizit.com adresindeki Online Shop'ta bulabilirsiniz

15

Toolfinder – köşe frezeleme



İçindekiler – köşe frezeleme

Sistem	Takma Uç	Kesici kenar uç başına	$a_{p\,max.}$ mm	Ø-Çap Aralığı mm			Çelik	Paslanmaz çelik	Dökme demir	Demir dışı metaller	Isıya dayanıklı alaşımlar	Sertleştirilmiş malzemeler	Metal dışı malzemeler	Sayfa
MaxiMill 491	**SNHU** 09T3.. / 1204..	8	6–8	Ø 25–32	Ø 25–32	Ø 40–160	●	●	●	●	●		○	53–59
MaxiMill 211	**XD.T** 0703.. / 11T3.. / 1505.. / 2007..	2	6–19	Ø 16–40	Ø 10–40	Ø 32–160	●	●	●	●	●	●	○	60–76
MaxiMill 211KN	**XD.T** 11T3.. / 1505.. / 2007..	2	27–75,5		Ø 25–50	Ø 40–80	●	●	●	●	●		○	65+71
MaxiMill 490	**SD..** 09T3.. / 1205..	4	8–11	Ø 25–32	Ø 25–32	Ø 40–125	●	●	●	●	●		○	77
MaxiMill 490K	**SD..** 09T3..	4	41			Ø 40–63	●	●	●	●	●		○	78
MaxiMill HSC	**XD..** 11T3.. / 1904..	2	10–18	Ø 16–40	Ø 16–32	Ø 40–125		○	●				○	82–87
MaxiMill HPC	**XD..** 1904..	2	10–18		Ø 22–32	Ø 40–63	Ø 25–50		○	●			○	
MaxiMill HPC	**ZNHW** 1205..	1	4–11			Ø 40–315		●	●			○	○	88+89
MaxiMill HPC	**ZNHW** 04T3..	1	4–11	Ø 20–40	Ø 20–40			●	●			○	○	
MaxiMill 210	**AP..** 1003..	2	8			Ø 40–80	●	●	●	●	●	●	○	

Diğer çaplar istek üzerine temin edilebilir.

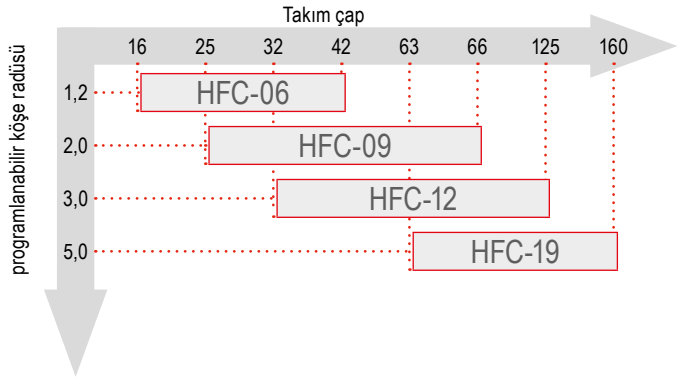
Artık listelenmeyen sistemler için takma uçları cuttingtools.ceratizit.com adresindeki Online Shop'ta bulabilirsiniz

Bu malzemeyi cuttingtools.ceratizit.com adresindeki Online Shop'ta bulabilirsiniz

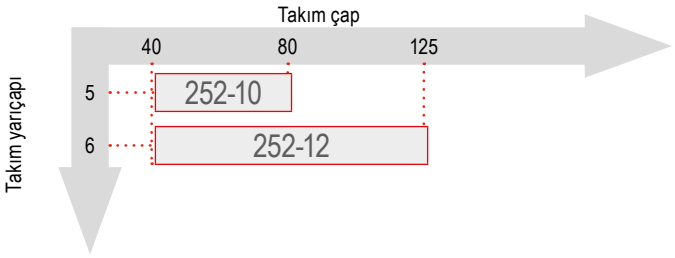
15

Toolfinder – kalıp frezeleme

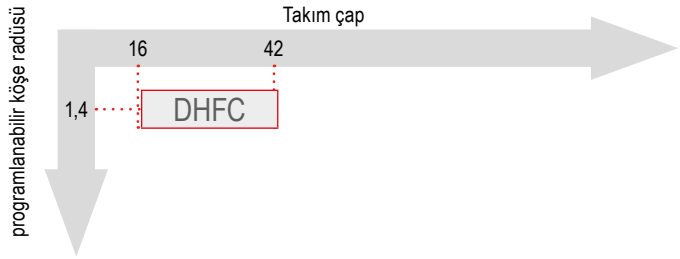
MaxiMill HFC 92–98



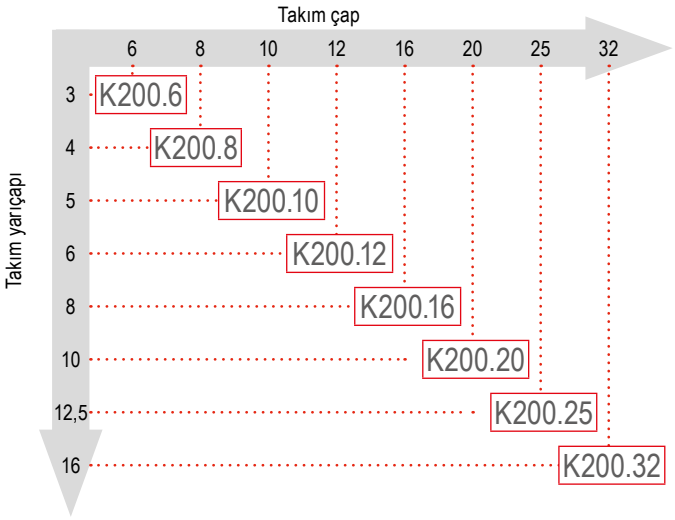
MaxiMill 252 115+116



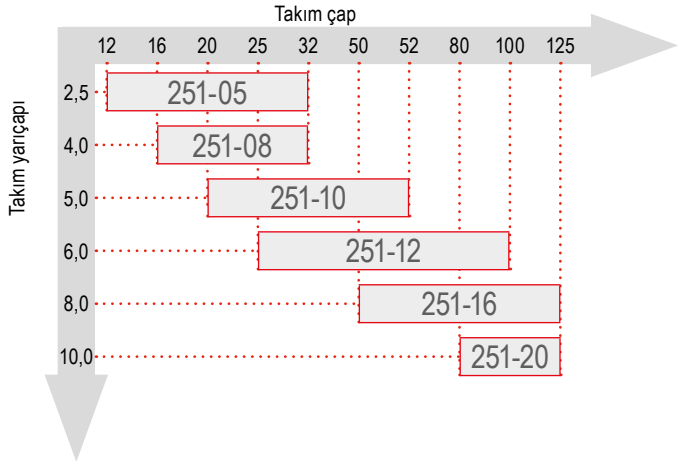
MaxiMill DHFC 99+100



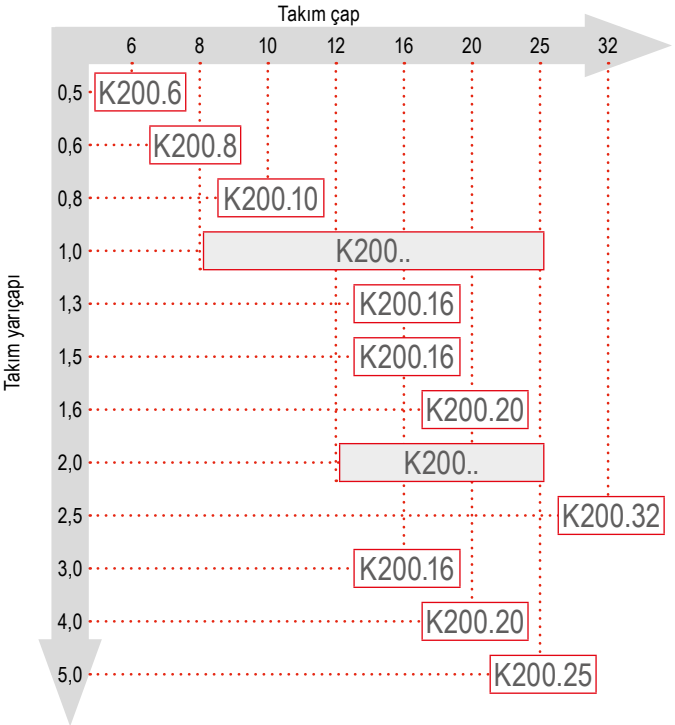
K200. Radyüs 117–121



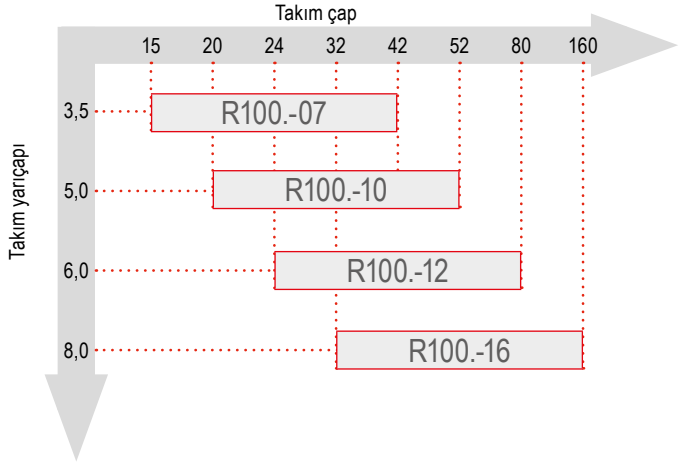
MaxiMill 251 RS 101–109



K200. Torus 122–125



R100. 110–114



Uygulama aralığı

Takım çap

Genel bakış – kalıp frezeleme

Sistem	Takma Uç	Kesici kenar uç başına	$a_{p\,max.}$ mm	Ø-Çap Aralığı mm			Çelik	Paslanmaz çelik	Dökme demir	Demir dışı metaller	Isıya dayanıklı alaşımlar	Sertleştirilmiş malzemeler	Metal dışı malzemeler	Sayfa
MaxiMill HFC	**X.LX** 06.. / 09.. / 12.. / 19..	4	0,8–3,3	Ø 16–42	Ø 16–35	Ø 32–160	●	●	●		●			92–98
MaxiMill DHFC	**LNKX** 09..	4	0,75	Ø 16–42	Ø 16–20		●	●	●		○			99+100
MaxiMill 251 RS	**R..X** 05.. / 08.. / 10.. / 12.. / 16.. / 20..	8	2,5–10	Ø 10–42	Ø 10–32	Ø 40–125	●	●	●	●	●		●	101–109
R100.	**RD.X** 07.. / 10.. / 12.. / 16..	8	5	Ø 15–42	Ø 15–20	Ø 42–160	●	●	●	●	●	●	○	110–114
MaxiMill 252	**RNHU** 10.. / 12..	8	3			Ø 40–125	●	●	○		●			115+116
K200. Radyüs	**RO.X** .... / **XOHX**	1	0,4–8	Ø 8–32	Ø 6–32		●	●	●	●	○	●	●	117–121
K200. Torus	**XO.X**	1	0,5–8	Ø 8–32	Ø 8–32		●	●	●	●	○	○	●	122–125

Diğer çaplar istek üzerine temin edilebilir.

Artık listelenmeyen sistemler için takma uçları cuttingtools.ceratizit.com adresindeki Online Shop'ta bulabilirsiniz

15

Genel bakış – Pah / Köşe frezeleme

Sistem	Takma Uç	Kesici kenar uç başına	$a_{p\,max.}$ mm	Ø-Çap Aralığı mm		Çelik	Paslanmaz çelik	Dökme demir	Demir dışı metaller	Isıya dayanıklı alaşımlar	Sertleştirilmiş malzemeler	Metal dışı malzemeler	Sayfa
MaxiMill 272	**SD..** 0903..	4	4	 Ø 6–25		●	●	○	●	●			38–40
MaxiMill 242	**LD..** 1504..	2			 Ø 50–92	●	●	●	●	○		○	90+91
MaxiMill 490	**SD..** 09T3.. / 1205..	4	6–11	 Ø 20,1–31,5		●	●	●	●	●		○	78–81

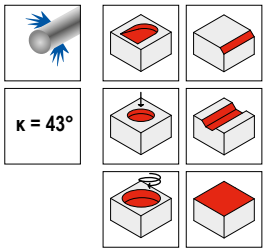
Diğer çaplar istek üzerine temin edilebilir.

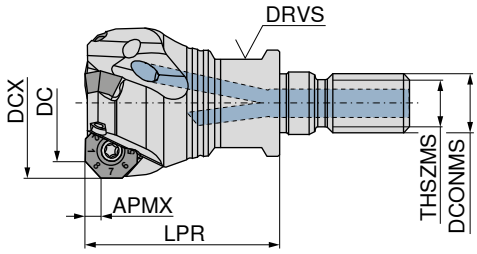
Genel bakış – kesme disk frezesi

Sistem	Takma Uç	Kesici kenar uç başına	$a_{p\,max.}$ mm	Ø-Çap Aralığı mm			Çelik	Paslanmaz çelik	Dökme demir	Demir dışı metaller	Isıya dayanıklı alaşımlar	Sertleştirilmiş malzemeler	Metal dışı malzemeler	Sayfa
MaxiMill Slot-SX	**SX** E...	1	115	 Ø 63–100	 Ø 80–315		●	●	●	●	●		○	126–141
TX	**TX..** R/L	3	64		 Ø 80–160	 Ø 100–200	●	●	●	●	○		○	142–144

Diğer çaplar istek üzerine temin edilebilir.

MaxiMill – 274-04/-09 Vidalı freze

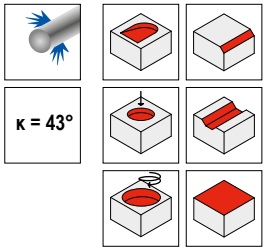


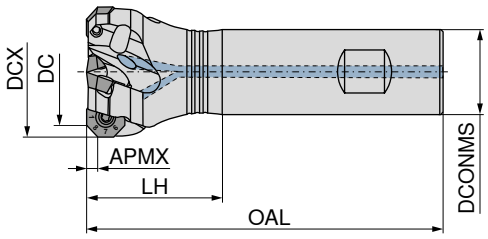




Tanımlama	DC mm	DCX mm	ZNF	APMX mm	LPR mm	THSZMS	DCONMS mm	DRVS mm	Sıkma momenti Nm	Uç	50 742 ...
G274.20.R.03-09	20	25,8	3	3,8	35	M12	12,5	17	1,2	OF.. 0403 / SF.. 0903	**020**
G274.25.R.04-09	25	30,8	4	3,8	35	M12	12,5	17	1,2	OF.. 0403 / SF.. 0903	**025**
G274.32.R.05-09	32	37,9	5	3,8	35	M16	17,0	24	1,2	OF.. 0403 / SF.. 0903	**032**

MaxiMill – 274-04/-09 Parmak Freze



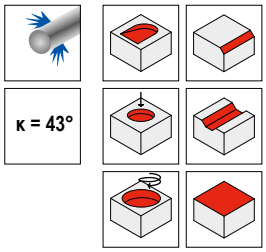


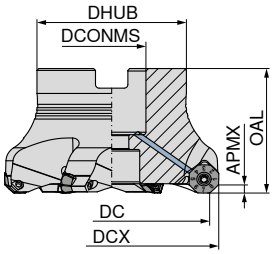


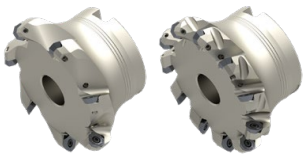
Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS mm	Sıkma momenti Nm	Uç	50 743 ...	50 743 ...
C274.20.R.03-09-A/B20-25	20	25,8	3	3,8	77	25	20	1,2	OF.. 0403 / SF.. 0903	**020**	**120**
C274.25.R.04-09-A/B20-32	25	30,8	4	3,8	84	32	20	1,2	OF.. 0403 / SF.. 0903	**025**	**125**
C274.32.R.05-09-A/B25-40	32	37,9	5	3,8	98	40	25	1,2	OF.. 0403 / SF.. 0903	**032**	**132**

15

MaxiMill – 274-04/-09 Yüzey Freze



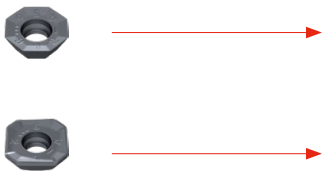




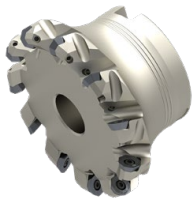
										50 744 ...		50 744 ...	
Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	Sıkma momenti Nm	Uç				
A274.32.R.05-09	32	37,9	5	3,8	40	38	16	1,6	OF.. 0403 / SF.. 0903				**032**
A274.40.R.04-09	40	46,0	4	3,8	40	38	16	1,6	OF.. 0403 / SF.. 0903		**040**		
A274.40.R.06-09	40	46,0	6	3,8	40	38	16	1,6	OF.. 0403 / SF.. 0903				**140**
A274.50.R.05-09	50	55,9	5	3,8	40	48	22	1,6	OF.. 0403 / SF.. 0903		**050**		
A274.50.R.07-09	50	55,9	7	3,8	40	48	22	1,6	OF.. 0403 / SF.. 0903				**150**
A274.63.R.06-09	63	68,9	6	3,8	40	48	22	1,6	OF.. 0403 / SF.. 0903		**063**		
A274.63.R.09-09	63	68,9	9	3,8	40	48	22	1,6	OF.. 0403 / SF.. 0903				**163**
A274.80.R.07-09	80	85,9	7	3,8	50	58	27	1,6	OF.. 0403 / SF.. 0903		**080**		
A274.80.R.11-09	80	85,9	11	3,8	50	58	27	1,6	OF.. 0403 / SF.. 0903				**180**
A274.100.R.09-09	100	105,9	9	3,8	50	78	32	1,6	OF.. 0403 / SF.. 0903		**100**		
A274.100.R.13-09	100	105,9	13	3,8	50	78	32	1,6	OF.. 0403 / SF.. 0903				**200**
A274.125.R.12-09	125	130,9	12	3,8	63	88	40	1,6	OF.. 0403 / SF.. 0903		**125**		

	Tork çubuğu	T – anahtar	D-Anahtar	Tesbit vidası Power	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
20 - 32	**043**		**125**		**303**	**133**	**191**
32 - 40	**043**	**040**	**125**	**151**	**303**	**133**	**191**
50 - 125	**043**		**125**		**303**	**133**	**191**

İki farklı geometri uç – Tek freze başlığı



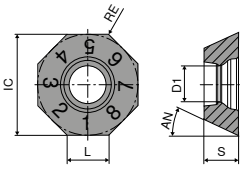




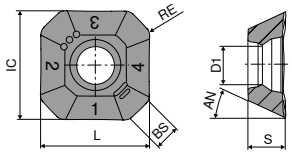


OFHT / OFHW / SFHT / SFKT

Tanımlama	IC	D1	L	BS	S	AN
	mm	mm	mm	mm	mm	°
OFH. 0403..	9,52	3,35	3,94	-	3,18	25
SF.T 0903..	9,80	3,35	9,00	2,25	3,50	25

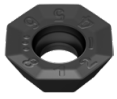
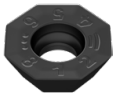
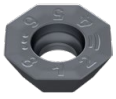


OF..

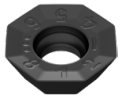
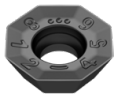


SF.T

OFHT

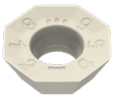
	-F50 CTCP230 DRAGONSKIN	-M50 CTCP230 DRAGONSKIN	-F50 CTPP235 DRAGONSKIN	-M50 CTPP235 DRAGONSKIN
				
	F	M	F	M
	OFHT	OFHT	OFHT	OFHT
	51 002 ...	51 003 ...	51 002 ...	51 003 ...
ISO / RE mm				
040305SN 0,5	005	005	105	105
P	●	●	●	●
M			○	○
K	○	○	○	○
N				
S				
H				
O				

OFHT / OFHW

	-F50 CTCM235 DRAGONSKIN	-F50 CTPM240 DRAGONSKIN	-M50 CTPM240 DRAGONSKIN	-F50 CTPM245 DRAGONSKIN	CTPM245 DRAGONSKIN	-F50 CTCM245 DRAGONSKIN	CTCM245 DRAGONSKIN
							
	F	F	M	F	F	F	F
	OFHT	OFHT	OFHT	OFHT	OFHW	OFHT	OFHW
	51 002 ...	51 002 ...	51 003 ...	51 002 ...	51 105 ...	51 002 ...	51 105 ...
ISO / RE mm							
040302EN 0,2					452		90201
040305SN 0,5	305	405	405	455		90501	
P	●	○	○	●	●	●	●
M	●	●	●	●	●	●	●
K							
N							
S						○	○
H							
O							

15

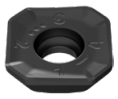
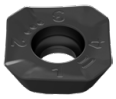
OFHT / OFHW

			NEW				
		-M50 CTCK215	-F10 CTPX715	-F10 CTWN215	-F50 CTC5240	CTC5240	-F50 CTCS245
		DRAGONSKIN	DRAGONSKIN		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
		M	F	F	F	F	F
		OFHT	OFHT	OFHT	OFHT	OFHW	OFHT
		51 003 ...	51 122 ...	50 459 ...	51 002 ...	50 457 ...	51 002 ...
ISO	RE mm						
040302EN	0,2					504	
040305FN	0,5		00502	505			
040305SN	0,5	505			15500		555
P			○				
M			○				
K		●	●	○			
N			●	●			
S			○		●	●	●
H							
O			○	○			

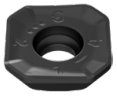
SFHT / SFKT

		-F50 CTPP225	-M50 CTPP225
		DRAGONSKIN	DRAGONSKIN
			
		F	M
		SFHT	SFKT
		51 012 ...	51 013 ...
ISO	RE mm		
0903AFSR	1	070	070
P		●	●
M			
K			
N			
S			
H			
O			

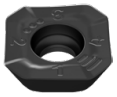
SFHT / SFKT

		-F50 CTCP230 DRAGONSKIN	-M50 CTCP230 DRAGONSKIN	-F50 CTPP235 DRAGONSKIN	-M50 CTPP235 DRAGONSKIN
					
		F	M	F	M
		SFHT	SFKT	SFHT	SFKT
		51 012 ...	51 013 ...	51 012 ...	51 013 ...
ISO	RE mm				
0903AFSR	1	020	020	120	120
P		●	●	●	●
M				○	○
K		○	○	○	○
N					
S					
H					
O					

SFHT / SFKT

		-F50 CTCM235 DRAGONSKIN	-F50 CTPM240 DRAGONSKIN	-M50 CTPM240 DRAGONSKIN	-F50 CTPM245 DRAGONSKIN	-F50 CTCM245 DRAGONSKIN
						
		F	F	M	F	F
		SFHT	SFHT	SFKT	SFHT	SFHT
		51 012 ...	51 012 ...	51 013 ...	51 012 ...	51 012 ...
ISO	RE mm					
0903AFSR	1	320	420	42000	470	92001
P		●	○	○	●	●
M		●	●	●	●	●
K						
N						
S						○
H						
O						

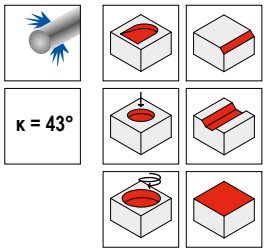
SFKT / SFHT

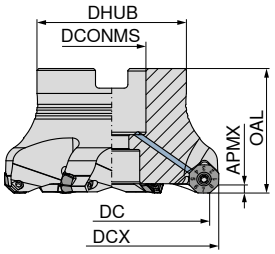
		NEW				
		-R50 CTCK215	-R50 CTPK220	-F10 CTPX715	-F10 CTWN215	-F40 CTC5240
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN		DRAGONSKIN
						
		R	R	F	F	F
		SFKT	SFKT	SFHT	SFHT	SFHT
		51 065 ...	51 065 ...	51 123 ...	50 514 ...	50 514 ...
ISO	RE mm					
0903AFFR	1			01502	505	
0903AFSR	1	520	620			504
P				○		
M				○		
K		●	●	●	○	
N				●	●	
S				○		●
H						
O				○	○	

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 149
Başlangıç parametreleri	→ 150	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – 274-05/-12 Yüzey Freze







Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	Sıkma momenti Nm	Uç	50 772 ...	50 772 ...
A274.40.R.03-12	40	48,0	3	6	40	38	16	3,2	OFHT 0504 / SFKT 1204	**24000**	
A274.40.R.04-12	40	48,0	4	6	40	38	16	3,2	OFHT 0504 / SFKT 1204		**04000**
A274.50.R.04-12	50	58,0	4	6	40	43	22	3,2	OFHT 0504 / SFKT 1204	**25000**	
A274.50.R.05-12	50	58,0	5	6	40	43	22	3,2	OFHT 0504 / SFKT 1204		**050**
A274.63.R.05-12	63	71,1	5	6	40	48	22	3,2	OFHT 0504 / SFKT 1204	**26300**	
A274.63.R.06-12	63	71,1	6	6	40	48	22	3,2	OFHT 0504 / SFKT 1204		**063**
A274.80.R.06-12	80	88,0	6	6	50	58	27	3,2	OFHT 0504 / SFKT 1204	**28000**	
A274.80.R.08-12	80	88,0	8	6	50	58	27	3,2	OFHT 0504 / SFKT 1204		**080**
A274.100.R.08-12	100	108,0	8	6	50	78	32	3,2	OFHT 0504 / SFKT 1204	**30000**	
A274.100.R.10-12	100	108,0	10	6	50	78	32	3,2	OFHT 0504 / SFKT 1204		**100**
A274.125.R.09-12	125	133,0	9	6	63	88	40	3,2	OFHT 0504 / SFKT 1204	**32500**	
A274.125.R.12-12	125	133,0	12	6	63	88	40	3,2	OFHT 0504 / SFKT 1204		**125**
A274.160.R.11-12	160	168,0	11	6	63	98	40	3,2	OFHT 0504 / SFKT 1204	**36000**[1)]	
A274.160.R.14-12	160	168,0	14	6	63	98	40	3,2	OFHT 0504 / SFKT 1204		**16000**[1)]

1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.

	Tork çubuğu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar					
DC					
40 - 160	**054**	**128**	**303**	**340**	**193**

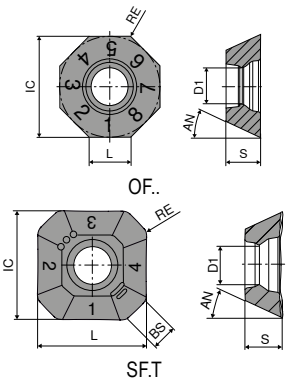
İki farklı geometri uç – Tek freze başlığı





OFHT / SFHT / SFKT

Tanımlama	IC	D1	L	BS	S	AN
	mm	mm	mm	mm	mm	°
OFHT 0504..	12,7	4,8	4,5	-	4,76	25
SF.T 1204..	12,7	4,8	12,7	1,42	4,76	25



OFHT

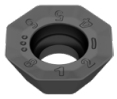
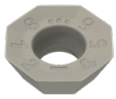
	-F50 CTCP230	-M50 CTCP230	-F50 CTPP235	-M50 CTPP235
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
				
	F	M	F	M
	OFHT	OFHT	OFHT	OFHT
	51 002 ...	51 003 ...	51 002 ...	51 003 ...
ISO / RE mm				
050410SN / 1	010	01000	110	11000
P	●	●	●	●
M			○	○
K	○	○	○	○
N				
S				
H				
O				

OFHT

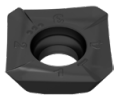
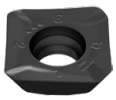
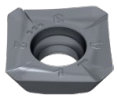
	-F50 CTCM235	-F50 CTPM240	-M50 CTPM240	-F50 CTPM245
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
				
	F	F	M	F
	OFHT	OFHT	OFHT	OFHT
	51 002 ...	51 002 ...	51 003 ...	51 002 ...
ISO / RE mm				
050410SN / 1	310	410	41000	460
P	●	○	○	●
M	●	●	●	●
K				
N				
S				
H				
O				

OFHT

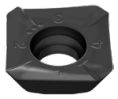
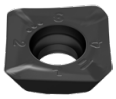
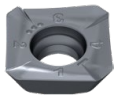
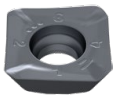
NEW

	-F50 CTCM245	-F10 CTPX715	-F10 CTWN215	-F50 CTC5240
	DRAGONSKIN	DRAGONSKIN		DRAGONSKIN
				
	F	F	F	F
	OFHT	OFHT	OFHT	OFHT
	51 002 ...	51 122 ...	51 122 ...	51 002 ...
ISO / RE mm				
050410FN 1		01002	36000	
050410SN 1	91001			16000
P	●	○		
M	●	○		
K		●	○	
N		●	●	
S	○	○		●
H				
O		○	○	

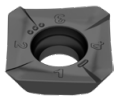
SFHT / SFKT

	-F50 CTCP230	-M50 CTCP230	-F50 CTPP235	-M50 CTPP235
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
				
	F	M	F	M
	SFHT	SFKT	SFHT	SFKT
	51 012 ...	51 013 ...	51 012 ...	51 013 ...
ISO / RE mm				
1204AFSR 1	02500	025	12500	125
P	●	●	●	●
M			○	○
K	○	○	○	○
N				
S				
H				
O				

SFHT / SFKT

		-F50 CTCM235	-M50 CTCM235	-F50 CTPM240	-M50 CTPM240
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		F	M	F	M
		SFHT	SFKT	SFHT	SFKT
		51 012 ...	51 013 ...	51 012 ...	51 013 ...
ISO	RE mm				
1204AFSR	1	325	325	42500	425
P		●	●	○	○
M		●	●	●	●
K					
N					
S					
H					
O					

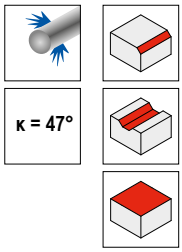
SFHT

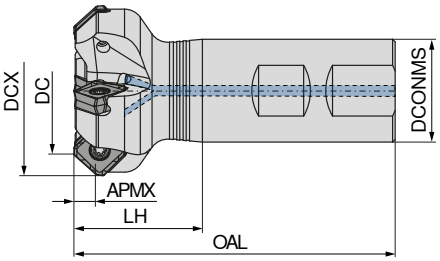
			-F50 CTPM245	-F50 CTCM245	NEW -F10 CTPX715	-F10 CTWN215	-F40 CTC5240
			DRAGONSKIN	DRAGONSKIN	DRAGONSKIN		DRAGONSKIN
							
			F	F	F	F	F
			SFHT	SFHT	SFHT	SFHT	SFHT
			51 012 ...	51 012 ...	51 123 ...	51 123 ...	50 514 ...
ISO	RE mm						
1204AFER	1						50900
1204AFFR	1				02502	37000	
1204AFSR	1		47500	92501			
P			●	●	○		
M			●	●	○		
K					●	○	
N					●	●	
S				○	○		●
H							
O					○	○	

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 151
Başlangıç parametreleri	→ 152	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – 271-12 Parmak Freze









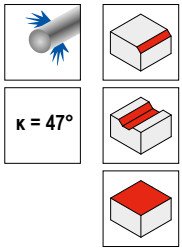
50 786 ...

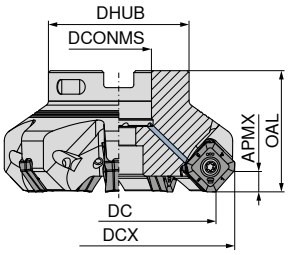
Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS $_{h6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
C271.32.R.03-12-B-40	32	45	3	6,8	100	40	32	18400	3,2	SOHU 1204.. / XOHU 1204..	**03203**
C271.40.R.04-12-B32-40	40	53	4	6,8	100	40	32	16800	3,2	SOHU 1204.. / XOHU 1204..	**04004**

	Tork çubuğu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar					
DC					
32 - 40	**054**	**120**	**303**	**859**	**193**

MaxiMill – 271-12 Yüzey freze

▲ 8 kesici kenarlı uç



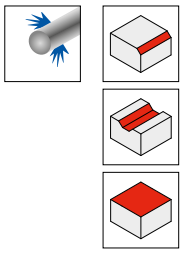


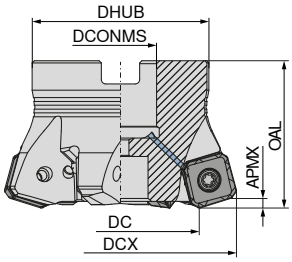


Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS H6 mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 787 ...		50 787 ...
A271.40.R.04-12	40	53	4	6,8	40	38	16	17900	3,2	SOHU 1204.. / XOHU 1204..			**04004**
A271.50.R.05-12	50	63	5	6,8	40	43	22	15200	3,2	SOHU 1204.. / XOHU 1204..			**05005**
A271.63.R.07-12	63	76	7	6,8	40	48	22	13100	3,2	SOHU 1204.. / XOHU 1204..			**06307**
A271.80.R.06-12	80	93	6	6,8	50	58	27	11300	3,2	SOHU 1204.. / XOHU 1204..	**08006**		
A271.80.R.08-12	80	93	8	6,8	50	58	27	11300	3,2	SOHU 1204.. / XOHU 1204..			**08008**
A271.100.R.07-12	100	113	7	6,8	63	78	32	9900	3,2	SOHU 1204.. / XOHU 1204..	**10007**		
A271.100.R.10-12	100	113	10	6,8	63	78	32	9900	3,2	SOHU 1204.. / XOHU 1204..			**10010**
A271.125.R.08-12	125	138	8	6,8	63	88	40	8700	3,2	SOHU 1204.. / XOHU 1204..	**12508**		
A271.125.R.12-12	125	138	12	6,8	63	88	40	8700	3,2	SOHU 1204.. / XOHU 1204..			**12512**
A271.160.R.09-12	160	173	9	6,8	63	98	40	7600	3,2	SOHU 1204.. / XOHU 1204..	**16009**[1]		
A271.160.R.14-12	160	173	14	6,8	63	98	40	7600	3,2	SOHU 1204.. / XOHU 1204..			**16014**[1]
A271.200.R.11-12	200	213	11	6,8	63	132	60	6700	3,2	SOHU 1204.. / XOHU 1204..	**20011**[2]		
A271.200.R.17-12	200	213	17	6,8	63	132	60	6700	3,2	SOHU 1204.. / XOHU 1204..			**20017**[2]
A271.250.R.13-12	250	263	13	6,8	63	132	60	6000	3,2	SOHU 1204.. / XOHU 1204..	**25013**[2]		
A271.250.R.21-12	250	263	21	6,8	63	132	60	6000	3,2	SOHU 1204.. / XOHU 1204..			**25021**[2]

1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.
2) Ön yüzde 4 ad. M16 imbus anahtar ağızlı vida, vidaların yerleşim dairesi çapı = 101,6 mm / İçten soğutmasız.

MaxiMill – 271-12 HFC Yüzey freze





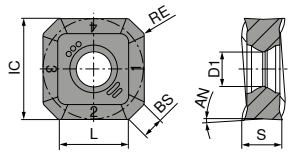


Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS H6 mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 788 ...
A271.50.R.04-12-HFC	30	50	4	2,6	40	43	22	14600	3,2	SOHU 1204..	**05004**
A271.63.R.06-12-HFC	43	63	6	2,6	40	48	22	12500	3,2	SOHU 1204..	**06306**
A271.80.R.07-12-HFC	60	80	7	2,6	50	58	27	10800	3,2	SOHU 1204..	**08007**

	Tork çubuğu	T – anahtar	D-Anahtar	Tesbit vidası Power	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
40 (5078704004)	**054**	**040**	**120**	**151**	**303**	**859**	**193**
50 - 250	**054**		**120**		**303**	**859**	**193**
50 (5078805004)	**054**	**050**	**120**	**154**	**303**	**859**	**193**

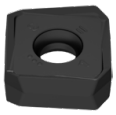
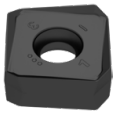
SOHU

Tanımlama	IC	D1	L	BS	S	AN
	mm	mm	mm	mm	mm	°
SOHU 1204..	13,36	4,4	8,8	1,7	5,00	7,4

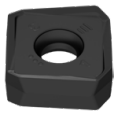
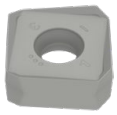


SOHU

SOHU

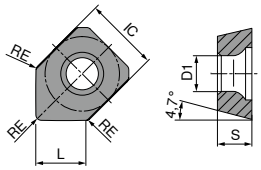
		-M50 CTCP230	-M50 CTPP235	-M50 CTCM235	-M50 CTPM240	-F50 CTPM245	-F50 CTCM245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
		SOHU	SOHU	SOHU	SOHU	SOHU	SOHU
		51 138 ...	51 138 ...	51 138 ...	51 138 ...	51 140 ...	51 140 ...
ISO	RE mm						
1204ABSR	0,8	02000	12000	32000	42000	47000	92001
P		●	●	●	○	●	●
M			○	●	●	●	●
K		○	○				
N							
S							○
H							
O							

SOHU

		-R50 CTCK215	-R50 CTPK220	-F40 CTC5240	-F50 CTC5240
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		SOHU	SOHU	SOHU	SOHU
		51 139 ...	51 139 ...	51 148 ...	51 140 ...
ISO	RE mm				
1204ABSR	0,8	52000	62000	12001	17000
P					
M					
K		●	●		
N					
S				●	●
H					
O					

XOHU

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XOHU 1204..	13,36	4,4	8,8	1,83	5,00



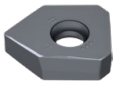
XOHU

XOHU

▲ Masterfinish değiştirilebilir kesici uç (geniş freze ucu)

-M50
CTPP235

DRAGONSKIN


XOHU

51 141 ...

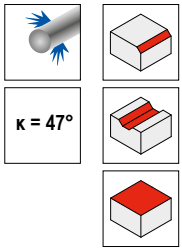
ISO	RE	
	mm	
1204ABSR	0,8	**12000**
P		●
M		○
K		○
N		
S		
H		
O		

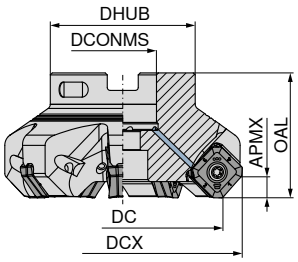
Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Başlangıç parametreleri	→ 153
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

MaxiMill – 271-17 Yüzey freze

▲ 8 kesici kenarlı uç







50 767 ...

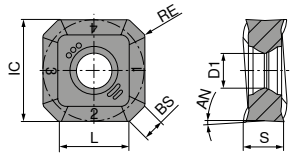
Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DCONMS mm	DHUB mm	Sıkma momenti Nm	Uç	
A271.50.R.04-17	50	66,1	4	8,4	40	22	43	5	SAKU 1706	**050**
A271.63.R.06-17	63	79,1	6	8,4	40	22	48	5	SAKU 1706	**063**
A271.80.R.07-17	80	96,1	7	8,4	50	27	58	5	SAKU 1706	**080**
A271.100.R.08-17	100	116,1	8	8,4	50	32	78	5	SAKU 1706	**100**
A271.125.R.10-17	125	141,1	10	8,4	63	40	88	5	SAKU 1706	**125**
A271.160.R.12-17	160	176,1	12	8,4	63	40	104	5	SAKU 1706	**16000**[1]
A271.200.R.13-17	200	216,1	13	8,4	63	60	134	5	SAKU 1706	**20000**[2]
A271.250.R.15-17	250	266,1	15	8,4	63	60	134	5	SAKU 1706	**25000**[2]

1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.
2) Ön yüzde 4 ad. M16 imbus anahtar ağızlı vida, vidaların yerleşim dairesi çapı = 101,6 mm / İçten soğutmasız.

	Tork çubuğu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar					
DC					
50 - 250	**037**	**114**	**303**	**302**	**193**

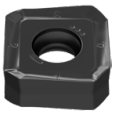
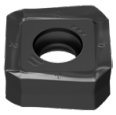
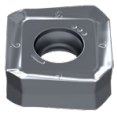
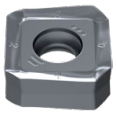
SAKU

Tanımlama	IC	D1	L	BS	S	AN
	mm	mm	mm	mm	mm	°
SAKU 1706..	17	5,8	11,85	3,7	6,35	3

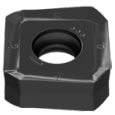
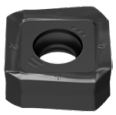
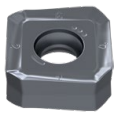


SAKU

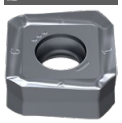
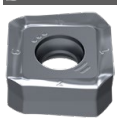
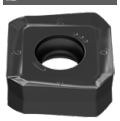
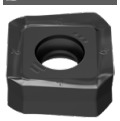
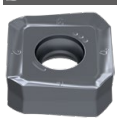
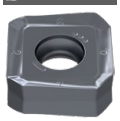
SAKU

		-F50 CTCP220	-M50 CTCP220	-F50 CTPP225	-M50 CTPP225
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		SAKU	SAKU	SAKU	SAKU
		51 004 ...	**51 005 ...**	**51 004 ...**	**51 005 ...**
ISO	RE mm				
1706ABSR	0,8	**270**	**270**	**070**	**070**
P		●	●	●	●
M					
K					
N					
S					
H					
O					

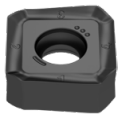
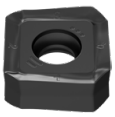
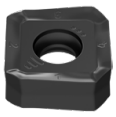
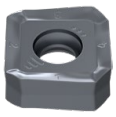
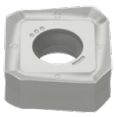
SAKU

		-F50 CTCP230	-M50 CTCP230	-F50 CTPP235	-M50 CTPP235
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		SAKU	SAKU	SAKU	SAKU
		51 004 ...	**51 005 ...**	**51 004 ...**	**51 005 ...**
ISO	RE mm				
1706ABSR	0,8	**020**	**020**	**120**	**120**
P		●	●	●	●
M				○	○
K		○	○	○	○
N					
S					
H					
O					

SAKU

	-F50 CTPM225	-M50 CTPM225	-F50 CTCM235	-M50 CTCM235	-F50 CTPM240	-M50 CTPM240	-F50 CTPM245
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
	SAKU	SAKU	SAKU	SAKU	SAKU	SAKU	SAKU
	51 004 ...	51 005 ...	51 004 ...	51 005 ...	51 004 ...	51 005 ...	51 004 ...
ISO / RE mm							
1706ABSR 0,8	220	220	320	320	420	420	470
P	●	●	●	●	○	○	●
M	●	●	●	●	●	●	●
K							
N							
S							
H							
O							

SAKU

	-F50 CTCM245	-M50 CTCK215	-R50 CTCK215	-M50 CTPK220	-R50 CTPK220	-F50 CTC5240	-F50 CTCS245
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
	SAKU	SAKU	SAKU	SAKU	SAKU	SAKU	SAKU
	51 004 ...	51 005 ...	51 058 ...	51 005 ...	51 058 ...	50 306 ...	51 004 ...
ISO / RE mm							
1706ABSR 0,8	92001	520	520	620	620	520	570
P	●						
M	●						
K		●	●	●	●		
N							
S	○					●	●
H							
O							

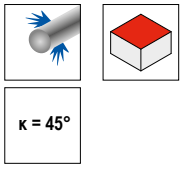
Frezeleme rehberi

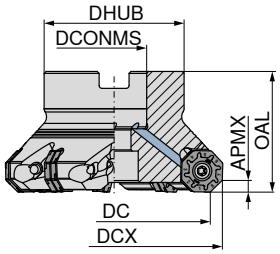
Kesme değerleri tablosu	→ 145–148	Başlangıç parametreleri	→ 153
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

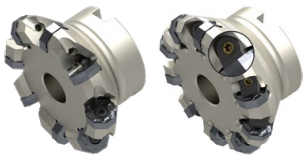
15

MaxiMill – 273-06 Yüzey freze

▲ 16 Kenarı kullanılabilen uç







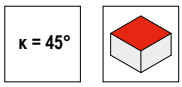
Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DCONMS mm	DHUB mm	Sıkma momenti Nm	Uç	50 741 ...	50 741 ...
A273.40.R.03-06	40	50,2	3	3,5	40	16	38	5	OAKU / XAHT 0605	**040**	
A273.40.R.04-06	40	50,2	4	3,5	40	16	38	5	OAKU / XAHT 0605	**140** [5]	
A273.50.R.05-06	50	60,2	5	3,5	40	22	43	5	OAKU / XAHT 0605	**050**	
A273.63.R.07-06	63	73,2	7	3,5	40	22	48	5	OAKU / XAHT 0605	**063**	
A273.80.R.08-06	80	90,2	8	3,5	50	27	58	5	OAKU / XAHT 0605	**080**	
A273.80.R.10-06	80	90,2	10	3,5	50	27	58	4	OAKU / XAHT 0605		**180** [1]
A273.100.R.10-06	100	110,2	10	3,5	50	32	78	5	OAKU / XAHT 0605	**100**	
A273.100.R.14-06	100	110,2	14	3,5	50	32	78	4	OAKU / XAHT 0605		**200** [1]
A273.125.R.12-06	125	135,2	12	3,5	63	40	88	5	OAKU / XAHT 0605	**125**	
A273.125.R.17-06	125	135,2	17	3,5	63	40	88	4	OAKU / XAHT 0605		**225** [1]
A273.160.R.14-06	160	170,2	14	3,5	63	40	104	5	OAKU / XAHT 0605	**160** [4]	
A273.160.R.20-06	160	170,2	20	3,5	63	40	104	4	OAKU / XAHT 0605		**260** [2]
A273.200.R.25-06	200	210,2	25	3,5	63	60	153	4	OAKU / XAHT 0605		**300** [3]
A273.250.R.31-06	250	260,2	31	3,5	63	60	153	4	OAKU / XAHT 0605		**25031** [3]

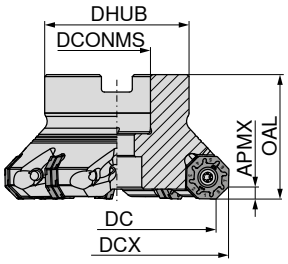
1) Baskı papuçlu versiyon, içten soğutmasız.
2) Baskı papuçlu versiyon, içten soğutmasız. / Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm.
3) Baskı papuçlu versiyon, içten soğutmasız. / Ön yüzde 4 ad. M16 imbus anahtar ağızlı vida, vidaların yerleşim dairesi çapı = 101,6 mm
4) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.
5) İçten soğutmasız.

Yedek parçalar DC	Tork çubuğu 80 950 ...	 T – anahtar 80 397 ...	 Baskı parçası vidası 70 950 ...	 Yüzey freze baskı parçası 70 950 ...	 D-Anahtar 80 950 ...	 Tesbit vidası Power 70 950 ...	 Sıkma vidası 70 950 ...	 Tork tornavidası. 80 950 ...
40	**037**	**040**			**114**	**151**	**302**	**193**
50	**037**	**050**			**114**	**154**	**302**	**193**
63 - 80	**037**				**114**		**302**	**193**
80 - 100	**036**		**844**	**845**	**113**			**193**
100 - 125	**037**				**114**		**302**	**193**
125	**036**		**844**	**845**	**113**			**193**
160	**037**				**114**		**302**	**193**
160 - 250	**036**		**844**	**845**	**113**			**193**

MaxiMill – 273-06 Yüzey freze

▲ her takma uç başına 16 kesme kenarı
▲ eksenel olarak ayarlanabilir







50 777 ...

Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DCONMS $_{H6}$ mm	DHUB mm	Sıkma momenti Nm	Uç	
A273.80.R.10A10-06	80	90,2	10	3,5	50	27	58	4	OAKU / XAHT 0605	**08010**[1)]
A273.100.R.14A14-06	100	110,2	14	3,5	50	32	78	4	OAKU / XAHT 0605	**10014**[1)]
A273.125.R.17A17-06	125	135,2	17	3,5	63	40	88	4	OAKU / XAHT 0605	**12517**[1)]
A273.160.R.20A20-06	160	170,2	20	3,5	63	40	104	4	OAKU / XAHT 0605	**16020**[2)]
A273.200.R.25A25-06	200	210,2	25	3,5	63	60	153	4	OAKU / XAHT 0605	**20025**[3)]
A273.250.R.31A31-06	250	260,2	31	3,5	63	60	153	4	OAKU / XAHT 0605	**25031**[3)]

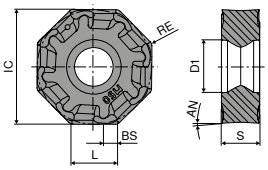
1) Baskı papuçlu versiyon.
2) Baskı papuçlu versiyon. / Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm.
3) Baskı papuçlu versiyon. / Ön yüzde 4 ad. M16 imbus anahtar ağızlı vida, vidaların yerleşim dairesi çapı = 101,6 mm

	Tork çubuğu	 Baskı parçası vidası	 Yüzey freze baskı parçası	D-Anahtar	 Vida Gresi	 Altlık	 Tork tornavidası.
	80 950 ...	**70 950 ...**	**70 950 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
80 - 250	**036**	**844**	**845**	**113**	**303**	**199**	**193**

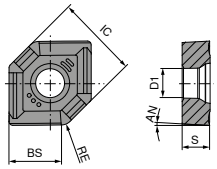
15

OAKU / XAHT

Tanımlama	IC	D1	L	BS	S	AN
	mm	mm	mm	mm	mm	°
XAHT 0605..	17,08	6,0	-	11,95	5,56	3
OAKU 0605..	17,10	5,8	6	2,00	5,66	3

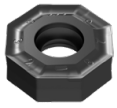
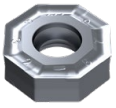


OAKU

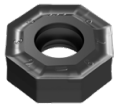
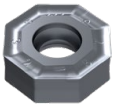


XAHT

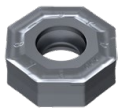
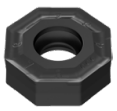
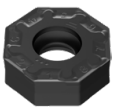
OAKU

		-F50 CTCP220	-M50 CTCP220	-F50 CTPP225	-M50 CTPP225
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		OAKU	OAKU	OAKU	OAKU
		51 000 ...	51 001 ...	51 000 ...	51 001 ...
ISO	RE mm				
060508SR	0,8	258	258	058	058
P		●	●	●	●
M					
K					
N					
S					
H					
O					

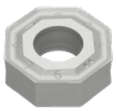
OAKU

		-F50 CTCP230	-M50 CTCP230	-F50 CTPP235	-M50 CTPP235
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		OAKU	OAKU	OAKU	OAKU
		51 000 ...	51 001 ...	51 000 ...	51 001 ...
ISO	RE mm				
060508SR	0,8	008	008	108	108
P		●	●	●	●
M				○	○
K		○	○	○	○
N					
S					
H					
O					

OAKU

		-F50 CTPM225	-M50 CTPM225	-F50 CTCM235	-M50 CTCM235	-F50 CTPM240	-M50 CTPM240	-F40 CTPM245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
								
		OAKU	OAKU	OAKU	OAKU	OAKU	OAKU	OAKU
		51 000 ...	51 001 ...	51 000 ...	51 001 ...	51 000 ...	51 001 ...	51 104 ...
ISO	RE mm							
060508ER	0,8							458
060508SR	0,8	208	208	308	308	408	408	
P		●	●	●	●	○	○	●
M		●	●	●	●	●	●	●
K								
N								
S								
H								
O								

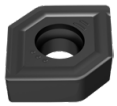
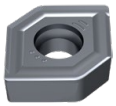
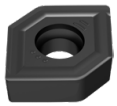
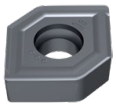
OAKU

		-F40 CTCM245	-M50 CTCK215	-R50 CTCK215	-M50 CTPK220	-R50 CTPK220	-F40 CTC5240	-F40 CTCS245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
								
		OAKU	OAKU	OAKU	OAKU	OAKU	OAKU	OAKU
		51 104 ...	51 001 ...	51 027 ...	51 001 ...	51 027 ...	50 446 ...	51 104 ...
ISO	RE mm							
060508ER	0,8	90801					550	50801
060508SR	0,8		508	508	608	608		
P		●						
M		●						
K			●	●	●	●		
N								
S		○					●	●
H								
O								

15

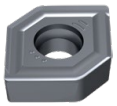
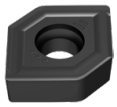
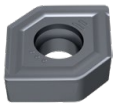
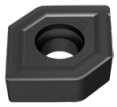
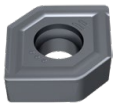
XAHT

▲ Masterfinish değiştirilebilir kesici uç (geniş freze ucu)

		-M50 CTCP220	-M50 CTPP225	-M50 CTCP230	-M50 CTPP235
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		XAHT	XAHT	XAHT	XAHT
		51 014 ...	51 014 ...	51 014 ...	51 014 ...
ISO	RE mm				
060525SR	2,5	275	075	025	125
P		●	●	●	●
M					○
K				○	○
N					
S					
H					
O					

XAHT

▲ Masterfinish değiştirilebilir kesici uç (geniş freze ucu)

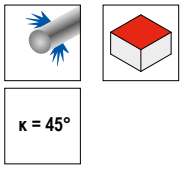
		-M50 CTPM225	-M50 CTCM235	-M50 CTPM240	-M50 CTCK215	-M50 CTPK220
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
						
		XAHT	XAHT	XAHT	XAHT	XAHT
		51 014 ...	51 014 ...	51 014 ...	51 014 ...	51 014 ...
ISO	RE mm					
060525SR	2,5	225	325	425	525	625
P		●	●	○		
M		●	●	●		
K					●	●
N						
S						
H						
O						

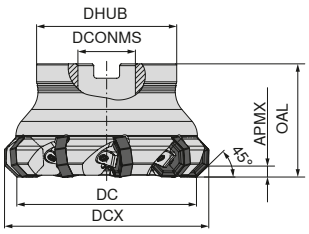
Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Başlangıç parametreleri	→ 154
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

MaxiMill – 273-08 Yüzey freze

▲ 16 Kenarı kullanılabilen uç







NEW NEW

Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DCONMS $_{H6}$ mm	DHUB mm	Sıkma momenti Nm	Uç	50 779 ...	50 779 ...
A273.63.R.05-08	63	76,7	5	5	50	22	48	5	ONKU 0806	**06300**	
A273.63.R.06-08	63	76,7	6	5	50	22	48	5	ONKU 0806		**16300**[1]
A273.80.R.06-08	80	93,7	6	5	50	27	58	5	ONKU 0806	**08000**	
A273.80.R.08-08	80	93,7	8	5	50	27	58	4	ONKU 0806		**18000**[1]
A273.100.R.07-08	100	113,7	7	5	63	32	78	5	ONKU 0806	**10000**	
A273.100.R.09-08	100	113,7	9	5	63	32	78	4	ONKU 0806		**20000**[1]
A273.125.R.08-08	125	138,7	8	5	63	40	88	5	ONKU 0806	**12500**	
A273.125.R.11-08	125	138,7	11	5	63	40	88	4	ONKU 0806		**22500**[1]
A273.160.R.10-08	160	173,7	10	5	63	40	98	5	ONKU 0806	**16000**[3]	
A273.160.R.14-08	160	173,7	14	5	63	40	98	4	ONKU 0806		**26000**[2]

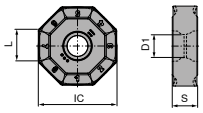
1) Baskı papuçlu versiyon.
2) Baskı papuçlu versiyon, içten soğutmasız. / Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm.
3) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.

Yedek parçalar için Ürün kodu	Tork çubuğu	 Baskı parçası vidası	 Yüzey freze baskı parçası	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**70 950 ...**	**70 950 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
50 779 06300	**055**			**129**	**303**	**821**	**193**
50 779 16300	**036**	**844**	**845**	**113**	**303**		**193**
50 779 08000	**055**			**129**	**303**	**821**	**193**
50 779 18000	**036**	**844**	**845**	**113**	**303**		**193**
50 779 10000	**055**			**129**	**303**	**821**	**193**
50 779 20000	**036**	**844**	**845**	**113**	**303**		**193**
50 779 12500	**055**			**129**	**303**	**821**	**193**
50 779 22500	**036**	**844**	**845**	**113**	**303**		**193**
50 779 16000	**055**			**129**	**303**	**821**	**193**
50 779 26000	**036**	**844**	**845**	**113**	**303**		**193**

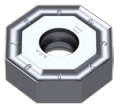
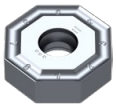
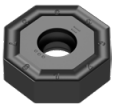
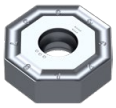
15

ONKU

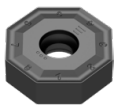
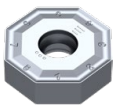
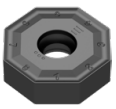
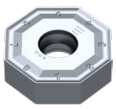
Tanımlama	IC mm	D1 mm	L mm	S mm
ONKU 0806..	22	5,8	8,45	6,45



ONKU

		NEW	NEW	NEW	NEW	NEW
		-M50 CTCP230	-M50 CTPP235	-M50 CTPM240	-M50 CTCK215	-M50 CTPK220
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
						
		ONKU	ONKU	ONKU	ONKU	ONKU
		51 163 ...	51 163 ...	51 163 ...	51 163 ...	51 163 ...
ISO	RE mm					
080608SN	0,8	**00800**	**10800**	**20800**	**50800**	**60800**
P		●	●	○		
M			○	●		
K		○	○		●	●
N						
S						
H						
O						

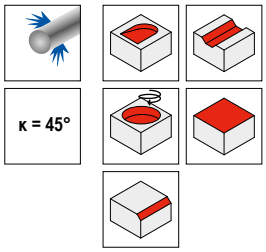
ONKU

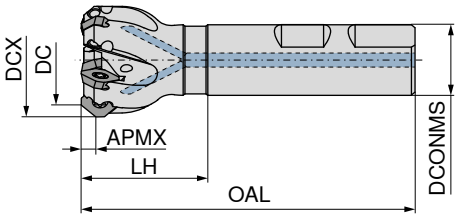
		NEW	NEW	NEW	NEW
		-R50 CTCP230	-R50 CTPP235	-R50 CTCK215	-R50 CTPK220
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		ONKU	ONKU	ONKU	ONKU
		51 164 ...	51 164 ...	51 164 ...	51 164 ...
ISO	RE mm				
080608SN	0,8	**00800**	**10800**	**50800**	**60800**
P		●	●		
M			○		
K		○	○	●	●
N					
S					
H					
O					

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Başlangıç parametreleri	→ 155
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

MaxiMill – 270-09 Parmak freze



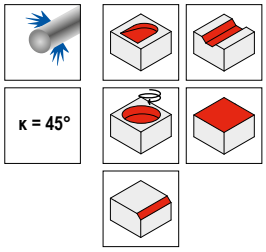


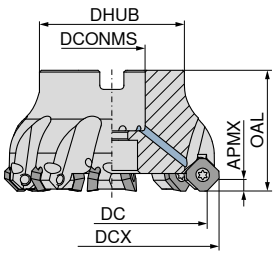




Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS mm	Sıkma momenti Nm	Uç	50 666 ...
C270.06.R.01-09	6	14,4	1	4	80	32	16	1,2	SD.. 0903..	**006**
C270.12.R.01-09	12	20,4	1	4	80	32	16	1,2	SD.. 0903..	**012**
C270.16.R.02-09	16	24,4	2	4	90	40	20	1,8	SD.. 0903..	**016**
C270.20.R.03-09	20	28,4	3	4	90	40	20	1,8	SD.. 0903..	**020**
C270.25.R.04-09	25	33,4	4	4	100	44	25	1,8	SD.. 0903..	**025**
C270.32.R.05-09	32	40,4	5	4	95	36	25	1,8	SD.. 0903..	**032**

MaxiMill – 270-09 Yüzey freze





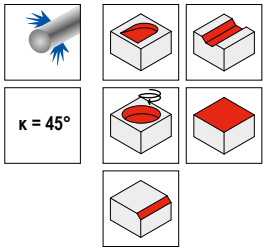


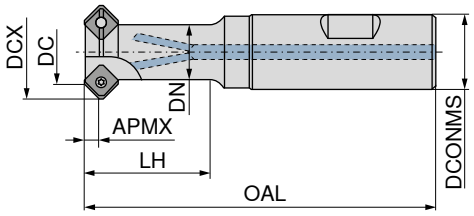
Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	Sıkma momenti Nm	Uç	50 705 ...	50 706 ...
A270.32.R.05-09	32	40,4	5	4	40	34	16	1,8	SD../XD.. 0903..		**532**
A270.40.R.04-09	40	48,4	4	4	40	38	16	1,8	SD../XD.. 0903..	**540**	
A270.40.R.06-09	40	48,4	6	4	40	38	16	1,8	SD../XD.. 0903..		**540**
A270.50.R.06-09	50	58,4	6	4	40	43	22	1,8	SD../XD.. 0903..	**550**	
A270.50.R.08-09	50	58,4	8	4	40	43	22	1,8	SD../XD.. 0903..		**550**
A270.63.R.08-09	63	71,4	8	4	40	48	22	1,8	SD../XD.. 0903..	**563**	
A270.63.R.10-09	63	71,4	10	4	40	48	22	1,8	SD../XD.. 0903..		**563**
A270.80.R.10-09	80	88,4	10	4	50	58	27	1,8	SD../XD.. 0903..	**580**	
A270.80.R.12-09	80	88,4	12	4	50	58	27	1,8	SD../XD.. 0903..		**580**
A270.100.R.12-09	100	108,4	12	4	50	78	32	1,8	SD../XD.. 0903..	**600**	
A270.100.R.14-09	100	108,4	14	4	50	78	32	1,8	SD../XD.. 0903..		**600**
A270.125.R.12-09	125	133,4	12	4	63	88	40	1,8	SD../XD.. 0903..	**625**	

▲ 50 705 ... Normal dişli versiyon. Alüminyum alaşımları, demir içermeyen metaller ve yumuşak çelik malzemelerden oluşan geniş bir dizi uygulama için.
▲ 50 706 ... Sık dişli versiyon. Çelik ve dökme demir malzemelerde yüksek ilerleme değerleri için.

MaxiMill – 272-09 Parmak freze

▲ İleri ve geri kullanışlı









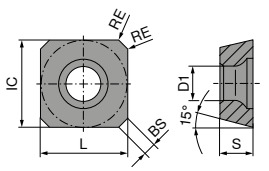
50 669 ...

Tanımlama	DC mm	DCX mm	ZNF	APMX mm	DN mm	OAL mm	LH mm	DCONMS mm	Sıkma momenti Nm	Uç	
C272.06.R.01-09	6	14,4	1	4	10	91	24,0	16	1,2	SD.. 0903..	**10600**
C272.08.R.01-09	8	16,4	1	4	10	91	25,5	16	1,2	SD.. 0903..	**008**
C272.12.R.01-09	12	20,4	1	4	12	91	26,0	16	1,2	SD.. 0903..	**012**
C272.16.R.02-09	16	24,4	2	4	15	97	30,0	20	1,8	SD.. 0903..	**016**
C272.18.R.02-09	18	26,4	2	4	16	97	30,0	20	1,8	SD.. 0903..	**018**
C272.25.R.03-09	25	33,4	3	4	21	109	35,0	25	1,8	SD.. 0903..	**025**

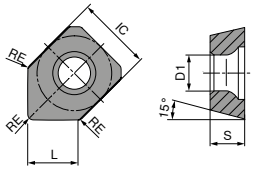
	Tork çubuğu	D-Anahtar	 Vida Gresi	 Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar					
DC					
6 - 12	**033**	**110**	**303**	**365**	**191**
16 - 25	**033**	**110**	**303**	**115**	**191**

SDHW / SDNT / SDHT / XDHW

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XDHW 0903..	9,52	3,4	5,50	1,68	3,18
SD.. 0903..	9,52	3,4	9,52	1,68	3,18

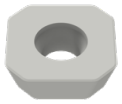
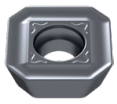
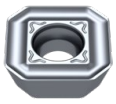
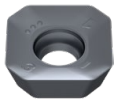


SD..

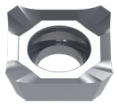
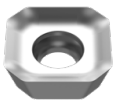


XDHW

SDHW / SDNT / SDHT

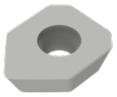
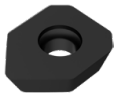
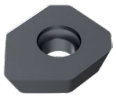
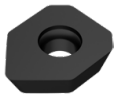
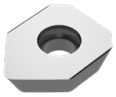
	TCM10	-29 CTCP230	-29 CTPP235	-33 CTPM240	-33P CTPM240	-F50 CTPM245	-F50 CTCM245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
	CERMET						
	SDHW	SDNT	SDNT	SDHT	SDHT	SDHT	SDHT
	50 428 ...	51 011 ...	51 011 ...	51 028 ...	51 086 ...	51 109 ...	51 109 ...
ISO / RE mm							
0903AESN / 1	898	020	120	420	420	470	92001
P	●	●	●	○	○	●	●
M			○	●	●	●	●
K	○	○	○				
N							
S							○
H							
O							

SDNT / SDHT

			-31 CTCK215	-F10 CTPX715	-27P H216T	-M31 CTC5240	-F50 CTCS245
				NEW			
			DRAGONSKIN	DRAGONSKIN		DRAGONSKIN	DRAGONSKIN
							
			SDNT	SDHT	SDHT	SDHT	SDHT
			51 029 ...	51 160 ...	50 426 ...	50 421 ...	51 109 ...
ISO	RE mm						
0903AEFN	1			02002	548		
0903AESN	1		520			509	57100
P				○			
M				○			
K			●	●	○		
N				●	●		
S				○		●	●
H							
O				○	○		

XDHW

▲ Masterfinish değiştirilebilir kesici uç (geniş freze ucu)

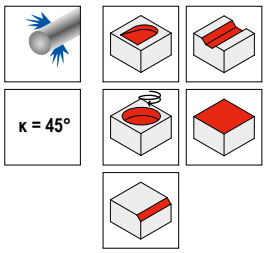
		TCM10	CTCP230	CTPP235	CTCK215	H216T
			DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	
						
		CERMET				
		XDHW	XDHW	XDHW	XDHW	XDHW
		50 449 ...	**51 015 ...**	**51 015 ...**	**51 015 ...**	**50 449 ...**
ISO	RE mm					
0903AEEN	1				**520**	
0903AEFN	1					**548**
0903AESN	1	**898**	**020**	**120**		
P		●	●	●		
M				○		
K		○	○	○	●	○
N						●
S						
H						
O						○

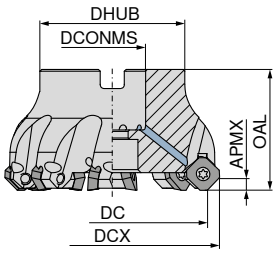
Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 156
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

MaxiMill – 270-12 Yüzey freze

▲ 50 705 ... Normal dişli versiyon, Alüminyum alaşımları, demir içermeyen metaller ve yumuşak çelikten oluşan geniş uygulama alanı için.
▲ 50 706 ... Sık dişli versiyon, çelik ve dökme demir malzemelerde yüksek ilerleme değerleri için







Tanımlama	DC mm	DCX mm	ZNF	APMX mm	DCONMS $_{H6}$ mm	OAL mm	DHUB mm	Sıkma momenti Nm	Uç	50 705 ...	50 706 ...
A270.40.R.03-12	40	54	3	6	16	40	38	5	SD../XD.. 1204..	**040**	
A270.40.R.04-12	40	54	4	6	16	40	38	5	SD../XD.. 1204..		**040**
A270.50.R.04-12	50	64	4	6	22	40	43	5	SD../XD.. 1204..	**050**	
A270.50.R.05-12	50	64	5	6	22	40	43	5	SD../XD.. 1204..		**050**
A270.63.R.04-12	63	77	4	6	22	40	48	5	SD../XD.. 1204..	**063**	
A270.63.R.06-12	63	77	6	6	22	40	48	5	SD../XD.. 1204..		**063**
A270.80.R.05-12	80	94	5	6	27	50	58	5	SD../XD.. 1204..	**080**	
A270.80.R.08-12	80	94	8	6	27	50	58	5	SD../XD.. 1204..		**080**
A270.100.R.06-12	100	114	6	6	32	50	78	5	SD../XD.. 1204..	**100**	
A270.100.R.10-12	100	114	10	6	32	50	78	5	SD../XD.. 1204..		**100**
A270.125.R.07-12	125	139	7	6	40	63	88	5	SD../XD.. 1204..	**125**	
A270.125.R.12-12	125	139	12	6	40	63	88	5	SD../XD.. 1204..		**125**
A270.160.R.08-12	160	174	8	6	40	63	94	5	SD../XD.. 1204..	**160** [1]	

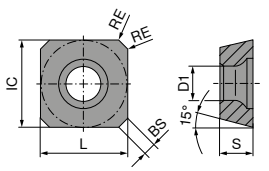
1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.

	Tork çubuğu	T – anahtar	D-Anahtar	Tesbit vidası Power	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
40	**037**	**040**	**114**	**151**	**303**	**01200**	**193**
50 - 160	**037**		**114**		**303**	**01200**	**193**

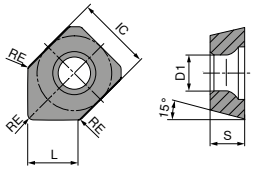
15

SDHT / SDHW / SDMT / XDHW

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XDHW 1204..	12,7	5,5	7,5	1,74	4,76
SD.. 1204..	12,7	5,5	12,7	1,74	4,76



SD..

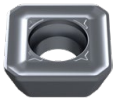


XDHW

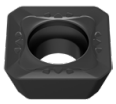
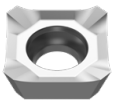
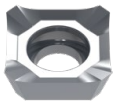
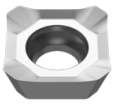
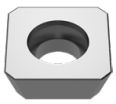
SDHT / SDHW / SDMT

	TCM10	-R TCM10	-29R CTCP230	-R CTCP230	CTCP230
			DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
	CERMET	CERMET			
	SDHT	SDHW	SDMT	SDHT	SDHW
	50 426 ...	50 428 ...	51 010 ...	51 006 ...	51 008 ...
ISO	RE mm				
1204AESN	0,2	900	899	020	020	020
1204AESN	1,0					
P		●	●	●	●	●
M						
K		○	○	○	○	○
N						
S						
H						
O						

SDMT / SDHT / SDHW

	-29R CTPP235	-R CTPP235	-R CTPP235	-33 CTPM240	-F50 CTPM245	-F50 CTCM245
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
						
	SDMT	SDHT	SDHW	SDHT	SDHT	SDHT
	51 010 ...	51 006 ...	51 008 ...	51 028 ...	51 109 ...	51 109 ...
ISO	RE mm					
1204AESN	1	120	120	120	425	475	92501
P		●	●	●	○	●	●
M		○	○	○	●	●	●
K		○	○	○			
N							
S							○
H							
O							

SDMT / SDHW / SDHT

		-31 CTCK215	-R CTCK215	-27 H216T	NEW -F10 CTPX715	-27P H216T	H216T
		DRAGONSKIN	DRAGONSKIN		DRAGONSKIN		
							
		SDMT	SDHW	SDHT	SDHT	SDHT	SDHW
		51 059 ...	51 008 ...	50 426 ...	51 160 ...	50 426 ...	50 428 ...
ISO	RE mm						
1204AEEN	1,0	520	520				
1204AEFN	0,2			504	02502		
1204AEFN	1,0					554	
1204AESN	0,2						600
P					○		
M					○		
K		●	●	○	●	○	○
N				●	●	●	●
S					○		
H							
O				○	○	○	○

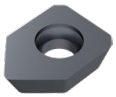
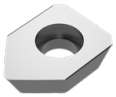
SDHT

		-M31 CTC5240	-F50 CTCS245
		DRAGONSKIN	DRAGONSKIN
			
		SDHT	SDHT
		50 421 ...	51 109 ...
ISO	RE mm		
1204AESN	1	512	57600
P			
M			
K			
N			
S		●	●
H			
O			

15

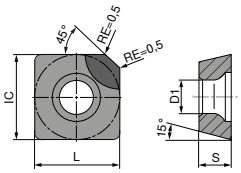
XDHW

▲ Masterfinish değiştirilebilir kesici uç (geniş freze ucu)

		TCM10	CTCP230	CTPP235	CTCK215	H216T
			DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	
						
		CERMET				
		XDHW	XDHW	XDHW	XDHW	XDHW
		50 449 ...	51 015 ...	51 015 ...	51 015 ...	50 449 ...
ISO	RE mm					
1204AEEN	1				525	
1204AEFN	1					600
1204AESN	1	900	025	125		
P		●	●	●		
M				○		
K		○	○	○	●	○
N						●
S						
H						
O						○

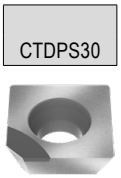
SDHW

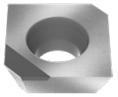
Tanımlama	IC	D1	L	S
	mm	mm	mm	mm
SDHW 1204..	12,7	5,5	12,7	4,76



SDHW

SDHW


CTDPS30


CTBS10U

DIAMOND
SDHW
51 900 ...

CBN
SDHW
51 900 ...

ISO		
1204AEFN-2	100 [1]	
1204AEFN-3	102 [2]	
1204AETN-2		300 [1]
P		
M		
K		●
N	●	
S		
H		○
O		

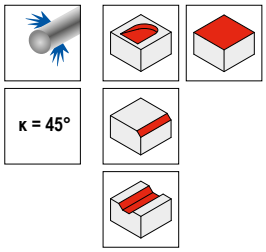
1) $a_{p\ maks.}$ = 2,0 mm
2) $a_{p\ maks.}$ = 3,5 mm

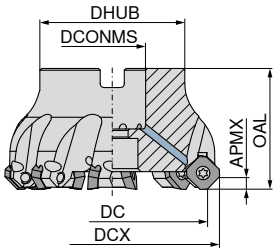
Frezeleme rehberi

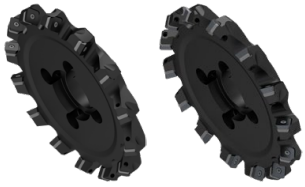
Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 156
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

15

MaxiMill – 270-19 Yüzey freze







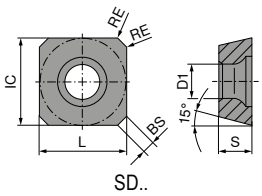
										Sol	Sağ
										50 698 ...	**50 698 ...**
Tanımlama	DC mm	DCX mm	ZNF	APMX mm	DCONMS $_{H6}$ mm	OAL mm	DHUB mm	Sıkma momenti Nm	Uç		
A270.125.R.07-19	125	146,4	7	10	40	63	88	5	SD.. 1907..		**12507**
A270.160.R.09-19	160	181,4	9	10	40	63	104	5	SD.. 1907..		**16009**[1)]
A270.200.R.11-19	200	221,1	11	10	60	63	134	5	SD.. 1907..		**20011**[2)]
A270.250.L.14-19	250	271,4	14	10	60	63	134	5	SD.. 1907..	**75014**[2)]	
A270.250.R.14-19	250	271,4	14	10	60	63	134	5	SD.. 1907..		**25014**[2)]
A270.315.L.17-19	315	336,4	17	10	60	63	226	5	SD.. 1907..	**81517**[4)]	
A270.315.R.17-19	315	336,4	17	10	60	63	226	5	SD.. 1907..		**31517**[3)]

1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.
2) Ön yüzde 4 ad. M16 imbus anahtar ağızlı vida, vidaların yerleşim dairesi çapı = 101,6 mm / İçten soğutmasız.
3) Ø 101,6 mm çap içerisinde M16 4 adet eşit bölümlenmiş bağlama civatası delikleri ile, Ø 177,8 mm çap içerisinde M20 4 adet eşit bölümlenmiş bağlama civatası delikleri ile. / İçten soğutmasız.
4) Ø 101,6 mm çap içerisinde M16 4 adet eşit bölümlenmiş bağlama civatası delikleri ile, Ø 177,8 mm çap içerisinde M20 4 adet eşit bölümlenmiş bağlama civatası delikleri ile.

Tork çubuğu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Altlık uç tipi-S	 Altlık vidası	 Tork tornavidası.	
80 950 ...	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**	
Yedek parçalar							
DC							
125 - 315	**037**	**114**	**303**	**302**	**01500**	**01400**	**193**

SDKT

Tanımlama	IC	D1	L	BS	S	AN
	mm	mm	mm	mm	mm	°
SDKT 1907..	19,15	6	19,15	1,5	7,15	15



SD..

SDKT

		-M50 CTCP220	-R50 CTPP225	-R50 CTCP230	-M50 CTPP235	-R50 CTPP235	-R50 CTPM225	-R50 CTCK215
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
								
		SDKT	SDKT	SDKT	SDKT	SDKT	SDKT	SDKT
		51 131 ...	51 132 ...	51 132 ...	51 131 ...	51 132 ...	51 132 ...	51 132 ...
ISO	RE mm							
1907AESN	1,6	22001	07000	02100	12000	12300	22200	52000
P		●	●	●	●	●	●	
M					○	○	●	
K				○	○	○		●
N								
S								
H								
O								

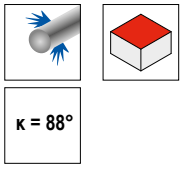
Frezeleme rehberi

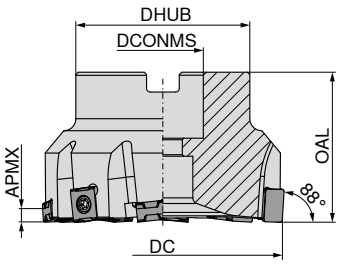
Kesme değerleri tablosu	→ 145–148	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

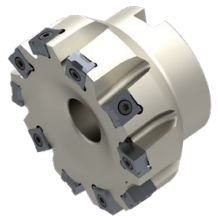
15

MaxiMill – HEC 11 Yüzey freze

▲ ayarlı değil







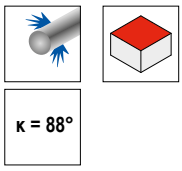
50 725 ...

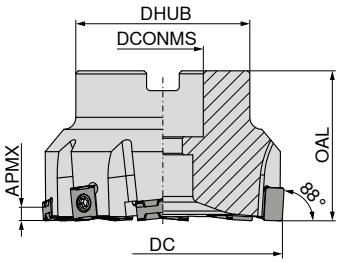
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
AHEC.50.R.06-11	50	6	6	40	48	22	12700	3,2	LNHX 1106	**050**
AHEC.63.R.08-11	63	8	6	40	48	22	10100	3,2	LNHX 1106	**063**
AHEC.80.R.10-11	80	10	6	50	58	27	8000	3,2	LNHX 1106	**080**
AHEC.100.R.12-11	100	12	6	50	78	32	6400	3,2	LNHX 1106	**100**
AHEC.125.R.12-11	125	12	6	63	88	40	5100	3,2	LNHX 1106	**125**
AHEC.125.R.16-11	125	16	6	63	88	40	5100	3,2	LNHX 1106	**12516**
AHEC.160.R.20-11	160	20	6	63	100	40	4000	3,2	LNHX 1106	**160** [1)]

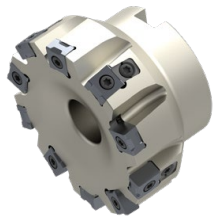
1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.

MaxiMill – HEC 11 Yüzey freze

▲ Eksenel olarak ayarlanabilir-ağızlar arası eşit







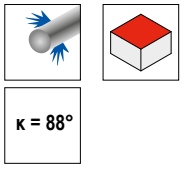
50 733 ...

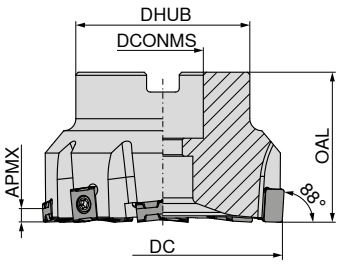
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
AHEC.50.R.06A03-11	50	6	6	40	48	22	12700	3,2	LNHX 1106	**050**
AHEC.63.R.08A04-11	63	8	6	40	48	22	10100	3,2	LNHX 1106	**063**
AHEC.80.R.10A05-11	80	10	6	50	58	27	8000	3,2	LNHX 1106	**080**
AHEC.100.R.12A06-11	100	12	6	50	78	32	6400	3,2	LNHX 1106	**100**
AHEC.125.R.16A08-11	125	16	6	63	88	40	5100	3,2	LNHX 1106	**125**
AHEC.160.R.20A10-11	160	20	6	63	100	40	4000	3,2	LNHX 1106	**160** [1)]

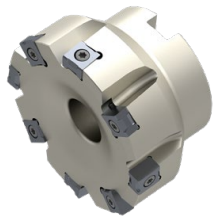
1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.

MaxiMill – HEC 11 Yüzey freze

▲ ağızlar arası eşitsiz diş hatveli, ayarlanamaz







50 733 ...

Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
AHEC.50.R.04B-11	50	4	6	40	48	22	12700	3,2	LNHX 1106	**550**
AHEC.63.R.06B-11	63	6	6	40	48	22	10100	3,2	LNHX 1106	**563**
AHEC.80.R.08B-11	80	8	6	50	58	27	8000	3,2	LNHX 1106	**580**
AHEC.100.R.10B-11	100	10	6	50	78	32	6400	3,2	LNHX 1106	**600**
AHEC.125.R.12B-11	125	12	6	63	88	40	5100	3,2	LNHX 1106	**625**
AHEC.160.R.14B-11	160	14	6	63	100	40	4000	3,2	LNHX 1106	**660** [1]

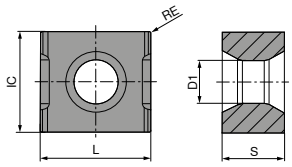
1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.

	Tork çubuğu	 Vida Gresi	 Soğutma sıvısı diski	 Sıkma vidası	 Altlık	 Tork tornavidası.
	80 950 ...	**70 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar						
DC						
50 - 63	**036**	**303**	**852**	**113**		**193**
80	**036**	**303**	**853**	**113**	**199**	**193**
100	**036**	**303**	**854**	**113**		**193**
125	**036**	**303**	**855**	**113**		**193**
160	**036**	**303**		**113**		**193**

15

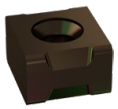
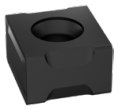
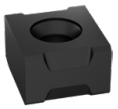
LNHX

Tanımlama	IC	D1	L	S
	mm	mm	mm	mm
LNHX 1106..	10	4,27	11	6,35



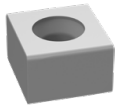
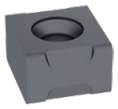
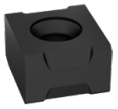
LNHX

LNHX

	CTEP210	CTCK215	-R50 CTCK215	-Q CTCK215
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
				
	CERMET			
	LNHX	LNHX	LNHX	LNHX
	51 046 ...	51 046 ...	51 024 ...	51 045 ...
ISO RE mm				
1106PNER 0,5		520	520	
1106ZZER 0,5				520 [1]
1106PNER 0,8	820			
110616EN 1,6		51600		
P	●			
M				
K	●	●	●	●
N				
S				
H				
O				

1) -Q = Geniş freze ucu

LNHX

	CTPK220	-R50 CTPK220	CTN3105	CTL3215	-Q CTL3215
	DRAGONSKIN	DRAGONSKIN			
					
			CERAMIC	CBN	CBN
	LNHX	LNHX	LNHX	LNHX	LNHX
	51 046 ...	51 024 ...	50 500 ...	51 046 ...	51 045 ...
ISO RE mm					
110608EN 0,8		608			
1106PNER 0,5	620	620			
1106PNSR 0,5			904		
1106PNSR				87200	
1106ZZER					87000 [1]
P					
M					
K	●	●	●	●	●
N					
S					
H				○	○
O					

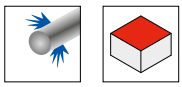
1) -Q = Geniş freze ucu

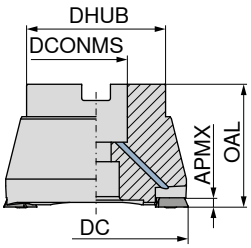
Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Montaj bilgileri	→ 157
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

Finiş freze F 5000 A

▲ Mikron hassasiyetinde ayarlanabilir uçlu takım
▲ Eksenel ayar vidası (56 950 017) ve Tork-20 anahtar (80 950 114)







Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DCONMS mm	DHUB mm	Sıkma momenti Nm	Uç	56 511 ...
F5000A.42.2.43.IK	42	2	0,2	43	16	35	3,2	TEHX 16T3..	**421**
F5000A.52.2.43.IK	52	2	0,2	43	22	48	3,2	TEHX 16T3..	**521**
F5000A.66.2.53.IK	66	2	0,2	53	27	60	3,2	TEHX 16T3..	**661**
F5000A.80.2.53.IK	80	2	0,2	53	27	60	3,2	TEHX 16T3..	**801**
F5000A.100.2.53	100	2	0,2	53	32	70	3,2	TEHX 16T3..	**910** [1]

1) İçten soğutmasız.

	Tork çubuğu	T-Anahtar	D-Anahtar	Tesbit vidası Power	Eksenel sapma ayar vidaları	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 950 ...**	**80 950 ...**	**56 950 ...**	**56 950 ...**	**70 950 ...**	**56 950 ...**	**80 950 ...**
Yedek parçalar								
DC								
42	**036**	**088**	**114**	**121**	**017**	**303**	**028**	**193**
52	**036**	**088**	**113**		**017**	**303**	**028**	**193**
66	**036**	**088**	**113**		**017**	**303**	**028**	**193**
80	**036**	**088**	**113**		**017**	**303**	**028**	**193**
100	**036**	**088**	**113**	**121**	**017**	**303**	**028**	**193**

Parça tanımlaması

▲ Takma uç sıkma vidası sıkma torku 56 950 028 ist 3,2 Nm.
▲ Bu takım, Rz ≤ 2,5 µm'ye kadar mükemmel yüzey kalitesi ve iyi eksenel hassasiyet sağlar.
▲ İki hassas ayar vidası µm aralığında ayarlamayı mümkün kılar.
▲ Ek olarak taşlamaya gerek kalmaz ve kısa işleme süresi ile maliyet düşer.
▲ Takım ayrıca stabil olmayan iş parçaları ve düşük güçlü tezgahlar için uygundur.

Eksenel sapma ayar vidaları her freze kafasına takılmakta ve önceden ayarlanmış bir değerde sıkılmaktadır. Aksi taktirde vidaların işleme sırasında gevşeme tehlikesi bulunmaktadır. Bu, iş parçası veya takımın hasar görmesine neden olabilir ve tezgah operatörü için tehlike yaratabilir. Hassas ayar vidalarına ihtiyaç duyulmaması durumunda, takımdan çıkarılmalarını öneriyoruz.

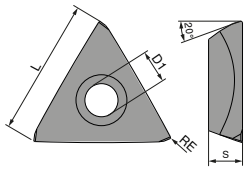
Malzeme	v_c m/dak	f_z mm	a_p mm
Çelik	150–250*)	0,5–2	0,05–0,2
Dökme demir	150–250*)	0,5–2	0,05–0,2
Sertleştirilmiş malzemeler ≤ 56 HRC	35–200*)	0,2–1	0,05–0,1

*) İşlenen malzemelerin yapısal özelliklerine bağlıdır.

15

TEHX

Tanımlama	L mm	S mm	D1 mm
TEHX 16T3..	14,32	4,00	3,9



TEHX

WTN1205



TEHX

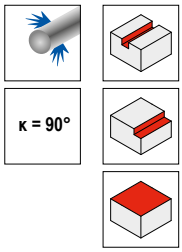
56 327 ...

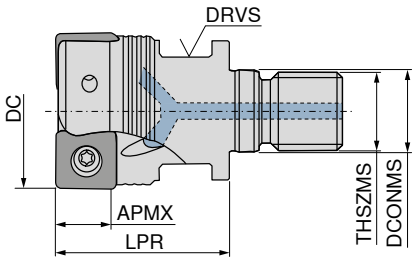
ISO	RE mm	
16T3ZF	0,2	**151**
P		●
M		●
K		●
N		
S		
H		●
O		

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – 491-09 Vidalı freze

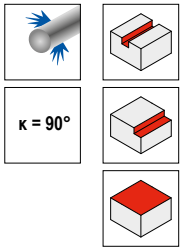


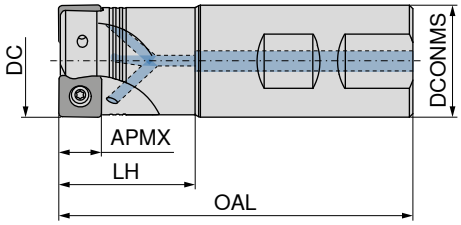




Tanımlama	DC mm	ZNF	APMX mm	LPR mm	THSZMS	DCONMS mm	DRVS mm	Sıkma momenti Nm	Uç	50 773 ...
G491.25.R.03-09	25	3	6	35	M12	12,5	17	2	SNHU 09T3	125
G491.32.R.03-09	32	3	6	35	M16	17,0	24	2	SNHU 09T3	132
G491.32.R.04-09	32	4	6	35	M16	17,0	24	2	SNHU 09T3	232

MaxiMill – 491-09 Parmak freze









Tanımlama	DC mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS $_{h6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 774 ...	50 774 ...
C491.25.R.03-09-B-32	25	3	6	89	32	25	23500	2	SNHU 09T3		425
C491.25.R.03-09-A-50-225	25	3	6	225	50	25	23500	2	SNHU 09T3	325	
C491.32.R.03-09-B-40	32	3	6	101	40	32	19600	2	SNHU 09T3		632
C491.32.R.04-09-B-40	32	4	6	101	40	32	19600	2	SNHU 09T3		432
C491.32.R.03-09-A-63-250	32	3	6	250	63	32	19600	2	SNHU 09T3	532	
C491.32.R.04-09-A-63-250	32	4	6	250	63	32	19600	2	SNHU 09T3	332	

Tork çubuğu
80 950 ...


D-Anahtar
80 950 ...


Vida Gresi
70 950 ...

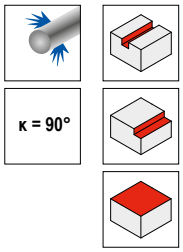

Sıkma vidası
70 950 ...

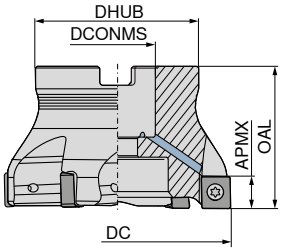

Tork tornavidası.
80 950 ...

Yedek parçalar DC	Tork çubuğu 80 950 ...	D-Anahtar 80 950 ...	Vida Gresi 70 950 ...	Sıkma vidası 70 950 ...	Tork tornavidası. 80 950 ...
25 - 32	053	119	303	710	193

15

MaxiMill – 491-09 Köşe freze





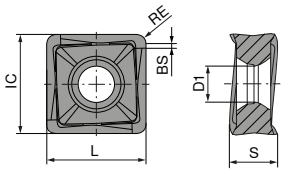


										50 776 ...		50 775 ...	
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç				
A491.40.R.03-09	40	3	6	40	38	16	16800	2	SNHU 09T3				**240**
A491.40.R.05-09	40	5	6	40	38	16	16800	2	SNHU 09T3		**240**		
A491.50.R.04-09	50	4	6	40	43	22	14600	2	SNHU 09T3				**250**
A491.50.R.06-09	50	6	6	40	43	22	14600	2	SNHU 09T3		**250**		
A491.63.R.05-09	63	5	6	40	48	22	12700	2	SNHU 09T3				**263**
A491.63.R.08-09	63	8	6	40	48	22	12700	2	SNHU 09T3		**263**		
A491.80.R.06-09	80	6	6	50	58	27	11100	2	SNHU 09T3				**280**
A491.80.R.10-09	80	10	6	50	58	27	11100	2	SNHU 09T3		**280**		
A491.100.R.07-09	100	7	6	50	78	32	9800	2	SNHU 09T3				**300**
A491.100.R.12-09	100	12	6	50	78	32	9800	2	SNHU 09T3		**300**		
A491.125.R.08-09	125	8	6	63	88	40	8700	2	SNHU 09T3				**325**
A491.125.R.15-09	125	15	6	63	88	40	8700	2	SNHU 09T3		**325**		

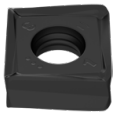
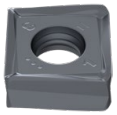
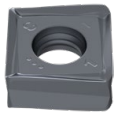
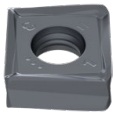
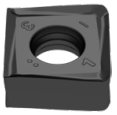
	Tork çubuğu	T – anahtar	D-Anahtar	Tesbit vidası Power	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
40	**053**	**040**	**119**	**151**	**303**	**710**	**193**
50 - 125	**053**		**119**		**303**	**710**	**193**

SNHU

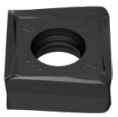
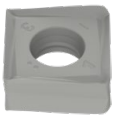
Tanımlama	IC	L	S	D1
	mm	mm	mm	mm
SNHU 09T3..	9,15	9,15	3,70	3,85



SNHU

		-M50 CTCP230	-M50 CTPP235	-F50 CTPM240	-M50 CTPM240	-F40 CTPM245	-F40 CTCM245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
		SNHU	SNHU	SNHU	SNHU	SNHU	SNHU
		51 120 ...	51 120 ...	51 119 ...	51 120 ...	51 126 ...	51 126 ...
ISO	RE mm						
09T308ER	0,8					45800	90801
09T308SR	0,8	008	108	408	408		
09T312SR	1,2	01200	11200	41200	41200		
09T316SR	1,6	01600	11600	41600	41600		
P		●	●	○	○	●	●
M			○	●	●	●	●
K		○	○				
N							
S							○
H							
O							

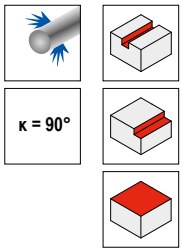
SNHU

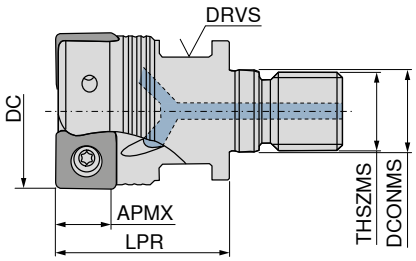
				NEW			
		-R50 CTCK215	-R50 CTPK220	-F10 CTPX715	-F10 CTWN215	-F40 CTC5240	-F40 CTCS245
		DRAGONSKIN		DRAGONSKIN		DRAGONSKIN	DRAGONSKIN
							
		SNHU	SNHU	SNHU	SNHU	SNHU	SNHU
		51 121 ...	51 121 ...	51 118 ...	51 118 ...	51 126 ...	51 126 ...
ISO	RE mm						
09T308ER	0,8					15800	55800
09T308FR	0,8			00802	358		
09T308SR	0,8	508	60800				
09T312FR	1,2				36200		
09T312SR	1,2	51200					
09T316FR	1,6				36600		
09T316SR	1,6	51600					
P				○			
M				○			
K		●	●	●	○		
N				●	●		
S				○		●	●
H							
O				○	○		

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Başlangıç parametreleri	→ 159
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

MaxiMill – 491-12 Vidalı freze

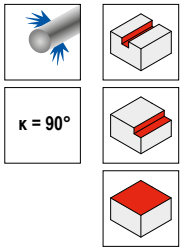


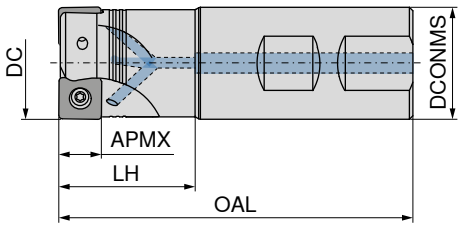




Tanımlama	DC mm	ZNF	APMX mm	LPR mm	THSZMS	DCONMS mm	DRVS mm	Sıkma momenti Nm	Uç	50 773 ...
G491.32.R.02-12	32	2	8	35	M16	17	24	3,2	SNHU 1204	**032**

MaxiMill – 491-12 Parmak freze









Tanımlama	DC mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS $_{h6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 774 ...	50 774 ...
C491.32.R.02-12-B-40	32	2	8	102	40	32	13600	3,2	SNHU 1204		**032**
C491.32.R.02-12-A-63-250	32	2	8	250	63	32	10200	3,2	SNHU 1204	**232**	

Tork çubuğu


D-Anahtar

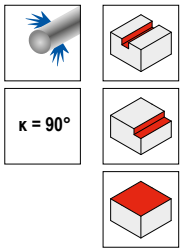

Vida Gresi

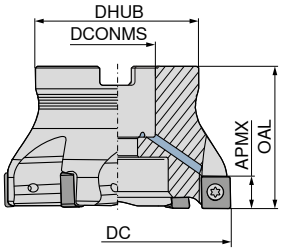

Sıkma vidası


Tork tornavidası.

Yedek parçalar DC	80 950 ...	80 950 ...	70 950 ...	70 950 ...	80 950 ...
32	**054**	**128**	**303**	**859**	**193**

MaxiMill – 491-12 Köşe freze







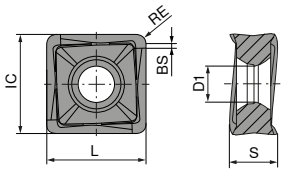
										50 776 ...		50 775 ...	
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç				
A491.40.R.03-12	40	3	8	40	38	16	11500	3,2	SNHU 1204				**040**
A491.40.R.04-12	40	4	8	40	38	16	11500	3,2	SNHU 1204		**040**		
A491.50.R.04-12	50	4	8	40	43	22	9800	3,2	SNHU 1204				**050**
A491.50.R.05-12	50	5	8	40	43	22	9800	3,2	SNHU 1204		**050**		
A491.63.R.05-12	63	5	8	40	48	22	8500	3,2	SNHU 1204				**063**
A491.63.R.06-12	63	6	8	40	48	22	8500	3,2	SNHU 1204		**063**		
A491.80.R.06-12	80	6	8	50	58	27	7400	3,2	SNHU 1204				**080**
A491.80.R.08-12	80	8	8	50	58	27	7400	3,2	SNHU 1204		**080**		
A491.100.R.07-12	100	7	8	50	78	32	6500	3,2	SNHU 1204				**100**
A491.100.R.10-12	100	10	8	50	78	32	6500	3,2	SNHU 1204		**100**		
A491.125.R.08-12	125	8	8	63	88	40	5700	3,2	SNHU 1204				**125**
A491.125.R.12-12	125	12	8	63	88	40	5700	3,2	SNHU 1204		**125**		
A491.160.R.09-12	160	9	8	63	98	40	5000	3,2	SNHU 1204				**160** [1]
A491.160.R.14-12	160	14	8	63	98	40	5000	3,2	SNHU 1204		**160** [1]		

1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.

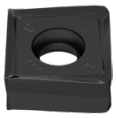
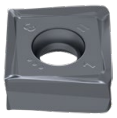
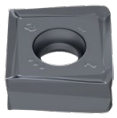
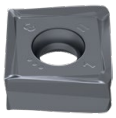
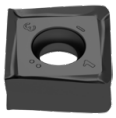
	Tork çubuğu	 T – anahtar	 D-Anahtar	 Tesbit vidası Power	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
40	**054**	**040**	**128**	**151**	**303**	**859**	**193**
50 - 160	**054**		**128**		**303**	**859**	**193**

SNHU

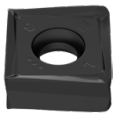
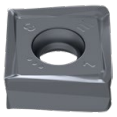
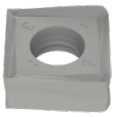
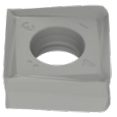
Tanımlama	IC	L	S	D1
	mm	mm	mm	mm
SNHU 1204..	12,2	12,2	5,00	4,4



SNHU

		-M50 CTCP230	-M50 CTPP235	-F50 CTPM240	-M50 CTPM240	-F40 CTPM245	-F40 CTCM245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
		SNHU	SNHU	SNHU	SNHU	SNHU	SNHU
		51 100 ...	51 100 ...	51 102 ...	51 100 ...	51 128 ...	51 128 ...
ISO	RE mm						
120408ER	0,8					45800	90801
120408SR	0,8	008	108	408	408		
120412SR	1,2		112	412			
120416SR	1,6		116	416			
120420SR	2,0		120	420			
P		●	●	○	○	●	●
M			○	●	●	●	●
K		○	○				
N							
S							○
H							
O							

SNHU

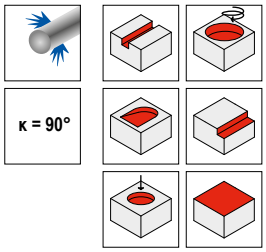
	-R50 CTCK215	-R50 CTPK220	NEW -F10 CTPX715	-F10 CTWN215	-F40 CTC5240	-F40 CTCS245
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN		DRAGONSKIN	DRAGONSKIN
						
	SNHU	SNHU	SNHU	SNHU	SNHU	SNHU
	51 103 ...	51 103 ...	51 101 ...	51 101 ...	51 128 ...	51 128 ...
ISO RE mm						
120408ER 0,8					**15800**	**55800**
120408FR 0,8			**00802**	**358**		
120408SR 0,8	**508**	**608**				
120412FR 1,2				**362**		
120412SR 1,2	**512**					
120416FR 1,6				**366**		
120416SR 1,6	**516**					
120420FR 2,0				**370**		
120420SR 2,0	**520**					
P			○			
M			○			
K	●	●	●	○		
N			●	●		
S			○		●	●
H						
O			○	○		

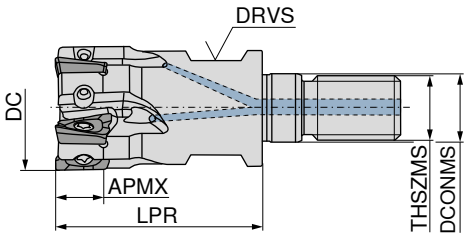
Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Başlangıç parametreleri	→ 159
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

15

MaxiMill – 211-07 Vidalı freze

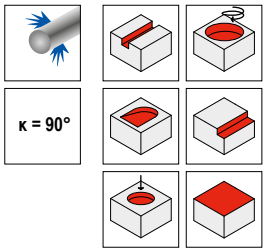


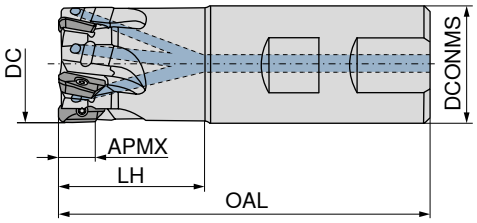




Tanımlama	DC mm	ZNF	APMX mm	LPR mm	DCONMS mm	THSZMS	DRVS mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 751 ...
G211.16.R.04-07	16	4	6	27	8,5	M8	10	50400	1	XD.T 0703	**016**
G211.20.R.05-07	20	5	6	33	10,5	M10	15	44280	1	XD.T 0703	**020**
G211.25.R.06-07	25	6	6	35	12,5	M12	17	39480	1	XD.T 0703	**025**
G211.32.R.08-07	32	8	6	35	17,0	M16	24	36240	1	XD.T 0703	**032**

MaxiMill – 211-07 Parmak freze

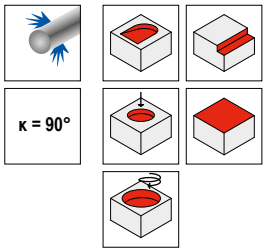


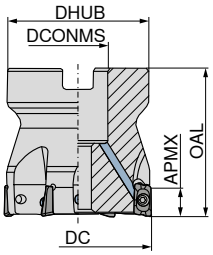


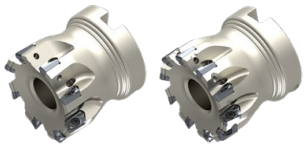


Tanımlama	DC mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 752 ...	50 752 ...
C211.10.R.01-07-A-20	10	1	6	61,0	20	10	72000	1	XD.T 0703	**010**	
C211.12.R.02-07-A-20	12	2	6	66,5	20	12	66600	1	XD.T 0703	**012**	
C211.16.R.04-07-A/B-25	16	4	6	74,5	25	16	50400	1	XD.T 0703	**016**	**216**
C211.16.R.03-07-A-32-165	16	3	6	165,0	32	16	17760	1	XD.T 0703	**116**	
C211.20.R.05-07-A/B-25	20	5	6	77,0	25	20	44280	1	XD.T 0703	**020**	**220**
C211.20.R.04-07-A-40-200	20	4	6	200,0	40	20	12600	1	XD.T 0703	**120**	
C211.25.R.06-07-A/B20-32	25	6	6	84,0	32	20	39840	1	XD.T 0703	**025**	**225**
C211.25.R.05-07-A20-50-225	25	5	6	225,0	50	20	11280	1	XD.T 0703	**125**	
C211.32.R.08-07-A/B25-40	32	8	6	98,0	40	25	36240	1	XD.T 0703	**032**	**232**

MaxiMill – 211-07 Köşe freze







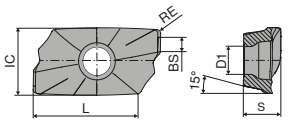
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DCONMS $_{H6}$ mm	DHUB mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 753 ...	50 754 ...
A211.32.R.06-07	32	6	6	40	16	38	36240	1	XD.T 0703	**032**	
A211.32.R.08-07	32	8	6	40	16	38	36240	1	XD.T 0703		**032**
A211.40.R.08-07	40	8	6	40	16	38	33240	1	XD.T 0703	**040**	
A211.40.R.10-07	40	10	6	40	16	38	33240	1	XD.T 0703		**040**
A211.50.R.10-07	50	10	6	40	22	43	30480	1	XD.T 0703	**050**	
A211.50.R.12-07	50	12	6	40	22	43	30480	1	XD.T 0703		**050**

Yedek parçalar DC	 Tork çubuğu **80 950 ...**	 T – anahtar **80 397 ...**	 D-Anahtar **80 950 ...**	 Tesbit vidası Power **70 950 ...**	 Vida Gresi **70 950 ...**	 Sıkma vidası **70 950 ...**	 Tork tornavidası. **80 950 ...**
10 - 32	**051**		**124**		**303**	**137**	**191**
32	**051**	**040**	**124**	**151**	**303**	**137**	**191**
40 - 50	**051**		**124**		**303**	**137**	**191**

15

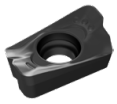
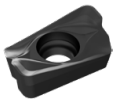
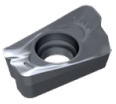
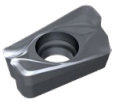
XDKT

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XDKT 0703..	4,9	2,5	7,8	1,2	3,18

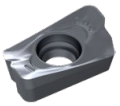
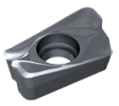
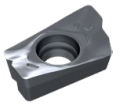
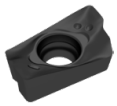
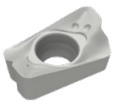


XDKT

XDKT

		-F50 CTCP230 DRAGONSKIN	-M50 CTCP230 DRAGONSKIN	-F50 CTPP235 DRAGONSKIN	-M50 CTPP235 DRAGONSKIN
					
		F XDKT	M XDKT	F XDKT	M XDKT
		51 033 ...	51 036 ...	51 033 ...	51 036 ...
ISO	RE mm				
070304SR	0,4	004	004	104	104
070308SR	0,8	008	008	108	108
P		●	●	●	●
M				○	○
K		○	○	○	○
N					
S					
H					
O					

XDKT

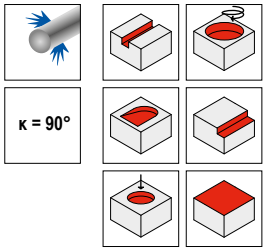
		-F50 CTPM240 DRAGONSKIN	-M50 CTPM240 DRAGONSKIN	-F40 CTPM245 DRAGONSKIN	-F40 CTCM245 DRAGONSKIN	-F20 CTWN215	-F40 CTC5240 DRAGONSKIN	-F40 CTCS245 DRAGONSKIN
								
		F XDKT	M XDKT	F XDKT	F XDKT	F XDKT	F XDKT	F XDKT
		51 033 ...	51 036 ...	51 112 ...	51 112 ...	50 507 ...	50 498 ...	51 112 ...
ISO	RE mm							
070304ER	0,4			454	90401		544	
070304FR	0,4					504		
070304SR	0,4	404	404					
070308ER	0,8			458	90801		548	558
070308FR	0,8					508		
070308SR	0,8	408	408					
P		○	○	●	●			
M		●	●	●	●			
K						○		
N						●		
S					○		●	●
H								
O						○		

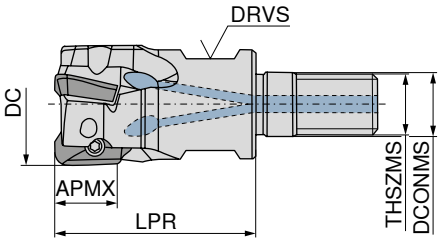
Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 160
Başlangıç parametreleri	→ 160	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – 211-11 Vidalı freze

▲ Uç radyusu >1,6 mm: Freze gövdesini modifiye ediniz!



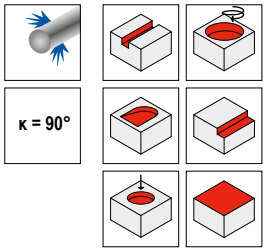


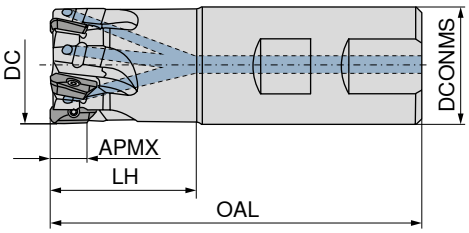


Tanımlama	DC	ZNF	APMX	LPR	DCONMS	THSZMS	DRVS	RPMX	Sıkma momenti	Uç	50 736 ...
	mm		mm	mm	mm		mm	1/min.	Nm		
G211.16.R.02-11	16	2	10	27	8,5	M8	10	42000	1,6	XD.T 11T3	016
G211.20.R.03-11	20	3	10	33	10,5	M10	15	36900	1,6	XD.T 11T3	020
G211.25.R.03-11	25	3	10	35	12,5	M12	17	33200	1,6	XD.T 11T3	12500
G211.25.R.04-11	25	4	10	35	12,5	M12	17	33200	1,6	XD.T 11T3	025
G211.32.R.04-11	32	4	10	35	17,0	M16	24	30200	1,6	XD.T 11T3	13200
G211.32.R.05-11	32	5	10	35	17,0	M16	24	30200	1,6	XD.T 11T3	032
G211.40.R.06-11	40	6	10	35	17,0	M16	27	27700	1,6	XD.T 11T3	040

MaxiMill – 211-11 Parmak freze

▲ Uç radyusu >1,6 mm: Freze gövdesini modifiye ediniz!





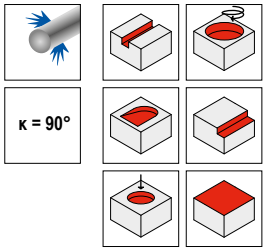


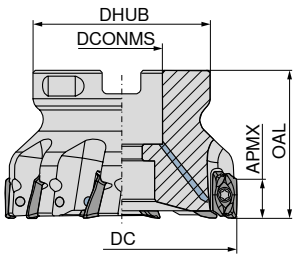


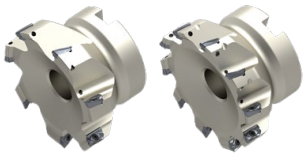
Tanımlama	DC	ZNF	APMX	OAL	LH	DCONMS $_{h6}$	RPMX	Sıkma momenti	Uç	50 737 ...	50 737 ...
	mm		mm	mm	mm	mm	1/min.	Nm			
C211.12.R.01-11-B-20	12	1	10	75	20	16	55000	1,6	XD.T 11T3		012
C211.16.R.02-11-A/B-25	16	2	10	75	25	16	42000	1,6	XD.T 11T3	116	016
C211.16.R.02-11-A15-32-165	16	2	10	165	32	15	14800	1,6	XD.T 11T3	316	
C211.16.R.02-11-A-32-165	16	2	10	165	32	16	14800	1,6	XD.T 11T3	216	
C211.20.R.03-11-A-25	20	3	10	77	25	20	36900	1,6	XD.T 11T3	120	
C211.20.R.03-11-B-25	20	3	10	77	25	20	36900	1,6	XD.T 11T3		020
C211.20.R.02-11-B-25	20	2	10	77	25	20	36900	1,6	XD.T 11T3		02002
C211.20.R.02-11-A-25	20	2	10	77	25	20	36900	1,6	XD.T 11T3	12002	
C211.20.R.03-11-A-32-165	20	3	10	165	32	20	15800	1,6	XD.T 11T3	320	
C211.20.R.02-11-A-40-200	20	2	10	200	40	20	10500	1,6	XD.T 11T3	420	
C211.20.R.02-11-A19-40-200	20	2	10	200	40	19	10500	1,6	XD.T 11T3	620	
C211.25.R.03-11-A/B-32	25	3	10	90	32	25	33200	1,6	XD.T 11T3	625	725
C211.25.R.04-11-A/B-32	25	4	10	90	32	25	33200	1,6	XD.T 11T3	125	025
C211.25.R.04-11-A-40-165	25	4	10	165	40	25	19900	1,6	XD.T 11T3	325	
C211.25.R.03-11-A-50-225	25	3	10	225	50	25	9400	1,6	XD.T 11T3	425	
C211.25.R.03-11-A24-50-225	25	3	10	225	50	24	9400	1,6	XD.T 11T3	825	
C211.25.R.02-11-A-50-225	25	2	10	225	50	25	9400	1,6	XD.T 11T3	02502	
C211.32.R.04-11-A-40	32	4	10	102	40	32	30200	1,6	XD.T 11T3	13204	
C211.32.R.05-11-A/B-40	32	5	10	102	40	32	30200	1,6	XD.T 11T3	132	032
C211.32.R.04-11-B-25	32	4	10	102	40	32	30200	1,6	XD.T 11T3		83200
C211.32.R.05-11-B25-40	32	5	10	102	40	25	30200	1,6	XD.T 11T3		73200
C211.32.R.04-11-A25-40	32	4	10	102	40	25	30200	1,6	XD.T 11T3	53204	
C211.32.R.05-11-A-50-165	32	5	10	165	50	32	20900	1,6	XD.T 11T3	332	
C211.32.R.04-11-A-64-250	32	4	10	250	64	32	8500	1,6	XD.T 11T3	432	
C211.40.R.06-11-B32-50	40	6	10	110	50	32	27700	1,6	XD.T 11T3		04000
C211.40.R.06-11-B-50	40	6	10	122	50	40	27700	1,6	XD.T 11T3		14000

MaxiMill – 211-11 Köşe freze

▲ Uç radyusu >1,6 mm: Freze gövdesini modifiye ediniz!





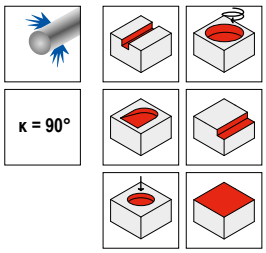


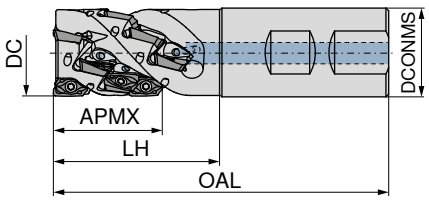
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DCONMS $_{H6}$ mm	DHUB mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 738 ...	50 739 ...
A211.40.R.04-11	40	4	10	40	16	38	27700	1,6	XD.T 11T3	**040**	
A211.40.R.06-11	40	6	10	40	16	38	27700	1,6	XD.T 11T3		**040**
A211.50.R.05-11	50	5	10	40	22	43	25400	1,6	XD.T 11T3	**050**	
A211.50.R.08-11	50	8	10	40	22	43	25400	1,6	XD.T 11T3		**050**
A211.63.R.06-11	63	6	10	40	22	48	23300	1,6	XD.T 11T3	**063**	
A211.63.R.10-11	63	10	10	40	22	48	23300	1,6	XD.T 11T3		**063**
A211.80.R.07-11	80	7	10	50	27	58	21300	1,6	XD.T 11T3	**080**	
A211.80.R.10-11	80	10	10	50	27	58	21300	1,6	XD.T 11T3		**180**
A211.80.R.12-11	80	12	10	50	27	58	21300	1,6	XD.T 11T3		**08012**
A211.100.R.08-11	100	8	10	50	32	78	19600	1,6	XD.T 11T3	**10000**	
A211.100.R.14-11	100	14	10	50	32	78	19600	1,6	XD.T 11T3		**10014**
A211.125.R.10-11	125	10	10	63	40	88	17900	1,6	XD.T 11T3	**12500**	

	Tork çubuğu	T – anahtar	D-Anahtar	Tesbit vidası Power	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
12	**043**		**125**		**303**	**92000**	**191**
16 - 32	**043**		**125**		**303**	**128**	**191**
40	**043**	**040**	**125**	**151**	**303**	**131**	**191**
50	**043**	**050**	**125**	**154**	**303**	**131**	**191**
63 - 125	**043**		**125**		**303**	**131**	**191**

MaxiMill – 211-11KN silindirik parmak alın frezesi

▲ ZEFP = Uç sayısı
▲ ZNP = diş sayısı





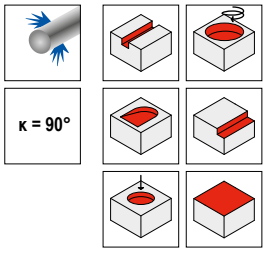


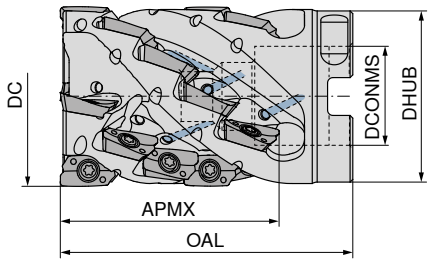
50 784 ...

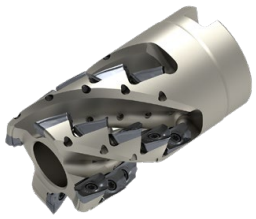
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS mm	ZEFP	ZNP	Sıkma momenti Nm	Uç	
C211.25.R.02KN3-11-B-40	25	2	28	97	40	25	6	3	1,6	XD.T 11T3	02523
C211.25.R.02KN4-11-B-50	25	2	37	107	50	25	8	4	1,6	XD.T 11T3	02524
C211.25.R.02KN5-11-B-60	25	2	46	117	60	25	10	5	1,6	XD.T 11T3	02525
C211.32.R.02KN4-11-B-50	32	2	37	111	50	32	8	4	1,6	XD.T 11T3	03224
C211.32.R.03KN5-11-B-60	32	3	46	121	60	32	15	5	1,6	XD.T 11T3	03235
C211.40.R.03KN4-11-B32-50	40	3	37	111	50	32	12	4	1,6	XD.T 11T3	04034
C211.40.R.04KN5-11-B32-60	40	4	46	121	60	32	20	5	1,6	XD.T 11T3	04045

MaxiMill – 211-11KN Değiştirlebilir Uçlu Vals Freze

▲ ZEFP = Uç sayısı
▲ ZNP = diş sayısı







50 794 ...

Tanımlama	DC mm	ZNF	APMX mm	ZEFP	ZNP	OAL mm	DCONMS H6 mm	DHUB mm	Sıkma momenti Nm	Uç	
A211.40.R.03KN4-11	40	3	37	12	4	65	22	38	1,6	XD.T 11T3	04034
A211.40.R.04KN4-11	40	4	37	16	4	65	22	38	1,6	XD.T 11T3	04044
A211.40.R.04KN5-11	40	4	46	20	5	74	22	38	1,6	XD.T 11T3	04045
A211.50.R.04KN5-11	50	4	46	20	5	75	27	48	1,6	XD.T 11T3	05045
A211.50.R.05KN5-11	50	5	46	25	5	75	27	48	1,6	XD.T 11T3	05055
A211.50.R.05KN6-11	50	5	55	30	6	85	27	48	1,6	XD.T 11T3	05056

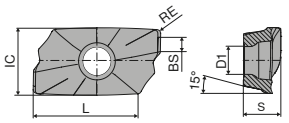
Yedek parçalar

Tanımlama	 Silindirik vida	Tork çubuğu	D-Anahtar	 Vida Gresi	 Sıkma vidası	 İmbus başlı vida	 Tork tornavidası.
	70 950 ...	80 950 ...	80 950 ...	70 950 ...	70 950 ...	70 950 ...	80 950 ...
A211.40.R.03KN4-11		043	125	303	20400	20900	191
A211.40.R.04KN4-11		043	125	303	20400	20900	191
A211.40.R.04KN5-11		043	125	303	20400	21000	191
A211.50.R.04KN5-11	002	043	125	303	20400	181	191
A211.50.R.05KN5-11	002	043	125	303	20400	181	191
A211.50.R.05KN6-11	002	043	125	303	20400	181	191
C211.25.R.02KN3-11-B-40		043	125	303	20700		191
C211.25.R.02KN4-11-B-50		043	125	303	20700		191
C211.25.R.02KN5-11-B-60		043	125	303	20700		191
C211.32.R.02KN4-11-B-50		043	125	303	20700		191
C211.32.R.03KN5-11-B-60		043	125	303	20700		191
C211.40.R.03KN4-11-B32-50		043	125	303	20400		191
C211.40.R.04KN5-11-B32-60		043	125	303	20400		191

15

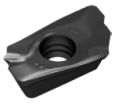
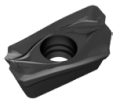
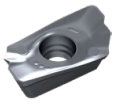
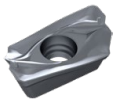
XDKT / XDHT

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XD.T 11T302..	6,8	2,8	10,6	2	3,80
XD.T 11T304..	6,8	2,8	10,6	1,8	3,80
XD.T 11T308..	6,8	2,8	10,6	1,4	3,80
XD.T 11T312..	6,8	2,8	10,6	1,4	3,80
XD.T 11T316..	6,8	2,8	10,6	1,4	3,80
XD.T 11T320..	6,8	2,8	10,6	1,4	3,80
XD.T 11T325..	6,8	2,8	10,6	1,4	3,80
XD.T 11T332..	6,8	2,8	10,6	0,8	3,80
XD.T 11T340..	6,8	2,8	10,6	-	3,80
XDHT 11T350..	6,8	2,8	10,6	-	3,80
XDKT 11T332..	6,8	2,8	10,6	1,4	3,80

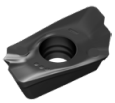
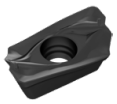
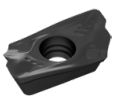
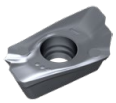
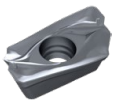
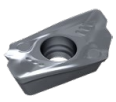


XDKT

XDKT

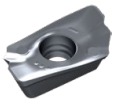
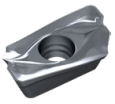
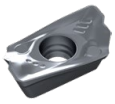
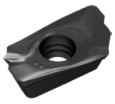
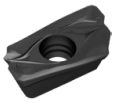
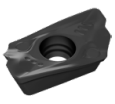
		-F50 CTCP220	-M50 CTCP220	-F50 CTPP225	-M50 CTPP225
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		F	M	F	M
		XDKT	XDKT	XDKT	XDKT
		51 034 ...	51 037 ...	51 034 ...	51 037 ...
ISO	RE mm				
11T308SR	0,8	258	258	058	058
P		●	●	●	●
M					
K					
N					
S					
H					
O					

XDKT

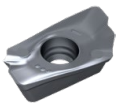
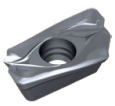
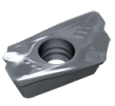
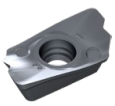
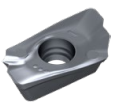
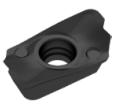
		-F50 CTCP230	-M50 CTCP230	-R50 CTCP230	-F50 CTPP235	-M50 CTPP235	-R50 CTPP235
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
		F	M	R	F	M	R
		XDKT	XDKT	XDKT	XDKT	XDKT	XDKT
		51 034 ...	51 037 ...	51 039 ...	51 034 ...	51 037 ...	51 039 ...
ISO	RE mm						
11T304SR	0,4	004	004	004	104	104	104
11T308SR	0,8	008	008	008	108	108	108
11T312SR	1,2		012			112	
11T320SR	2,0	020 1)	020 1)	020 1)	120 1)	120 1)	120 1)
11T325SR	2,5	025 1)	025 1)	025 1)	125 1)	125 1)	125 1)
P		●	●	●	●	●	●
M					○	○	○
K		○	○	○	○	○	○
N							
S							
H							
O							

1) Uç radyusu > 1,6 mm: Freze gövdesini modifiye ediniz!

XDKT

		-F50 CTPM225 DRAGONSKIN	-M50 CTPM225 DRAGONSKIN	-R50 CTPM225 DRAGONSKIN	-F50 CTCM235 DRAGONSKIN	-M50 CTCM235 DRAGONSKIN	-R50 CTCM235 DRAGONSKIN
							
		F XDKT	M XDKT	R XDKT	F XDKT	M XDKT	R XDKT
		51 034 ...	51 037 ...	51 039 ...	51 034 ...	51 037 ...	51 039 ...
ISO	RE mm						
11T308SR	0,8	208	208	208	308	308	308
P		●	●	●	●	●	●
M		●	●	●	●	●	●
K							
N							
S							
H							
O							

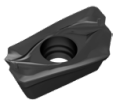
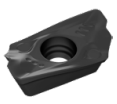
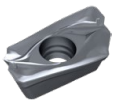
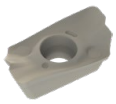
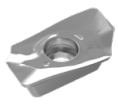
XDKT

		-F50 CTPM240 DRAGONSKIN	-M50 CTPM240 DRAGONSKIN	-R50 CTPM240 DRAGONSKIN	-F40 CTPM245 DRAGONSKIN	-F50 CTPM245 DRAGONSKIN	-F40 CTCM245 DRAGONSKIN	-F50 CTCM245 DRAGONSKIN
								
		F XDKT	M XDKT	R XDKT	F XDKT	F XDKT	F XDKT	F XDKT
		51 034 ...	51 037 ...	51 039 ...	51 113 ...	51 034 ...	51 113 ...	51 034 ...
ISO	RE mm							
11T304ER	0,4				454		90401	
11T304SR	0,4		404					
11T308ER	0,8				458		90801	
11T308SR	0,8	408	408	408		458		90801
11T312ER	1,2				462		91201	
11T312SR	1,2	412	412	412				
11T316ER	1,6				466		91601	
11T320ER	2,0				470 [1)]		92001 [1)]	
11T320SR	2,0	420 [1)]	420 [1)]	420 [1)]				
11T325ER	2,5				475 [1)]		92501 [1)]	
11T332ER	3,2				482 [1)]		93201 [1)]	
11T332SR	3,2	432 [1)]	432 [1)]	432 [1)]				
11T340ER	4,0				490 [1)]		94001 [1)]	
P		○	○	○	●	●	●	●
M		●	●	●	●	●	●	●
K								
N								
S							○	○
H								
O								

1) Uç radyusu > 1,6 mm: Freze gövdesini modifiye ediniz!

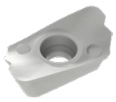
15

XDKT / XDHT

	-M50 CTCK215	-R50 CTCK215	-M50 CTPK220	-F20 CTWN215	NEW -F10 CTPX715	-27P H216T
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN		DRAGONSKIN	
						
	M	R	M	F	F	F
	XDKT	XDKT	XDKT	XDKT	XDHT	XDHT
	51 037 ...	51 039 ...	51 037 ...	50 478 ...	51 155 ...	50 477 ...
ISO / RE mm						
11T302FR 0,2				502	00202	502
11T304FR 0,4				504	00402	504
11T304SR 0,4	504					
11T308FR 0,8				508	00802	508
11T308SR 0,8	508	508	608			
11T312FR 1,2					01202	512
11T316FR 1,6					01602	516
11T320FR 2,0				520 1)	02002 1)	520 1)
11T325FR 2,5				525 1)	02502 1)	525 1)
11T332FR 3,2					03202 1)	532 1)
11T340FR 4,0					04002 1)	540 1)
11T350FR 5,0					05002 1)	550 1)
P					○	
M					○	
K	●	●	●	○	●	○
N				●	●	●
S					○	
H						
O				○	○	○

1) Uç radyusu > 1,6 mm: Freze gövdesini modifiye ediniz!

XDKT

	-F40 CTC5240	-F40 CTCS245	-R60 CTP6215
	DRAGONSKIN	DRAGONSKIN	
			
	F	F	R
	XDKT	XDKT	XDKT
	50 463 ...	51 113 ...	50 464 ...
ISO / RE mm			
11T304ER 0,4	504		
11T308ER 0,8	500	558	
11T308SR 0,8			300
11T312ER 1,2	512	562	
11T316ER 1,6	516	566	
11T320ER 2,0	520 1)	570	
11T325ER 2,5	525 1)	57500 1)	
11T332ER 3,2	532 1)	582	
11T340ER 4,0	540 1)	59000 1)	
P			
M			
K			●
N			
S	●	●	
H			●
O			

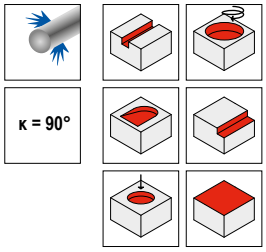
1) Uç radyusu > 1,6 mm: Freze gövdesini modifiye ediniz!

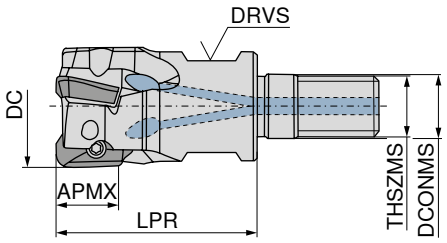
Frezeleme rehberi

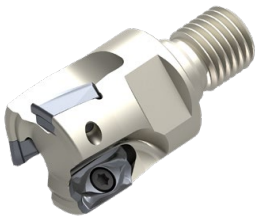
Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 161
Başlangıç parametreleri	→ 161	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – 211-15 Vidalı freze

▲ Uç radyusu > 2,5 mm: Freze gövdesini modifiye ediniz!



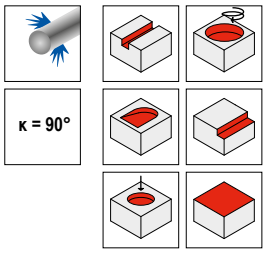


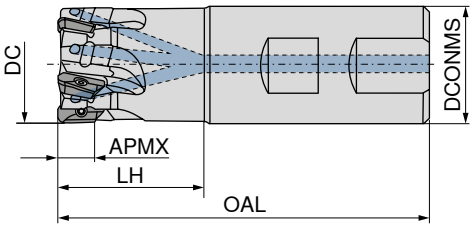


Tanımlama	DC mm	ZNF	APMX mm	LPR mm	DCONMS mm	THSZMS	DRVS mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 746 ...
G211.25.R.02-15	25	2	14	35	12,5	M12	17	26560	3,2	XD.T 1505	**025**
G211.32.R.03-15	32	3	14	35	17,0	M16	24	30200	3,2	XD.T 1505	**032**
G211.40.R.04-15	40	4	14	40	17,0	M16	27	27700	3,2	XD.T 1505	**040**

MaxiMill – 211-15 Parmak freze

▲ Uç radyusu >2,5 mm: Freze gövdesini modifiye ediniz!





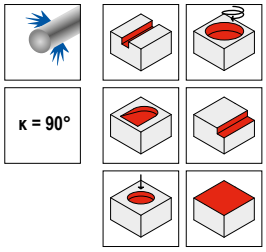


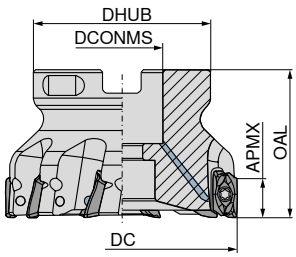
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 747 ...	50 747 ...
C211.25.R.02-15-B20-32	25	2	14	83	32	20	26560	3,2	XD.T 1505		**125**
C211.25.R.02-15-B/A-32	25	2	14	90	32	25	26560	3,2	XD.T 1505	**225**	**025**
C211.25.R.02-15-A-50-225	25	2	14	225	50	25	7520	3,2	XD.T 1505	**325**	
C211.32.R.03-15-B25-40	32	3	14	96	40	25	22160	3,2	XD.T 1505		**132**
C211.32.R.03-15-A-40	32	3	14	103	40	32	24160	3,2	XD.T 1505	**232**	
C211.32.R.03-15-B-40	32	3	14	103	40	32	24160	3,2	XD.T 1505		**032**
C211.32.R.03-15-A-63-250	32	3	14	250	63	32	6800	3,2	XD.T 1505	**332**	
C211.40.R.04-15-A-50	40	4	14	110	50	32	22160	3,2	XD.T 1505	**240**	
C211.40.R.04-15-B32-50	40	4	14	110	50	32	22160	3,2	XD.T 1505		**040**
C211.40.R.03-15-A-50-275	40	3	14	275	50	32	6120	3,2	XD.T 1505	**340**	

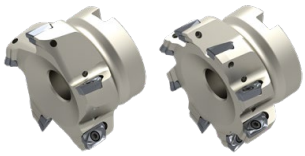
15

MaxiMill – 211-15 Köşe freze

▲ Uç radyusu >2,5 mm: Freze gövdesini modifiye ediniz!







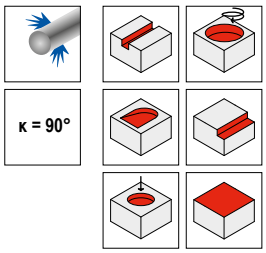
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DCONMS H6 mm	DHUB mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 748 ...	50 749 ...
A211.40.R.03-15	40	3	14	40	16	38	22160	3,2	XD.T 1505	**040**	
A211.40.R.04-15	40	4	14	40	16	38	22160	3,2	XD.T 1505		**040**
A211.50.R.03-15	50	3	14	40	22	43	20320	3,2	XD.T 1505	**050**	
A211.50.R.05-15	50	5	14	40	22	43	20320	3,2	XD.T 1505		**050**
A211.63.R.04-15	63	4	14	45	22	48	18640	3,2	XD.T 1505	**063**	
A211.63.R.06-15	63	6	14	45	22	48	18640	3,2	XD.T 1505		**063**
A211.80.R.05-15	80	5	14	50	27	58	17040	3,2	XD.T 1505	**080**	
A211.80.R.08-15	80	8	14	50	27	58	17040	3,2	XD.T 1505		**080**
A211.100.R.06-15	100	6	14	50	32	78	15680	3,2	XD.T 1505	**100**	
A211.100.R.10-15	100	10	14	50	32	78	15680	3,2	XD.T 1505		**100**
A211.125.R.07-15	125	7	14	63	40	88	14320	3,2	XD.T 1505	**125**	
A211.125.R.11-15	125	11	14	63	40	88	14320	3,2	XD.T 1505		**125**
A211.160.R.08-15	160	8	14	63	40	93	13200	3,2	XD.T 1505	**160** 1)	
A211.160.R.12-15	160	12	14	63	40	93	13200	3,2	XD.T 1505		**160** 1)

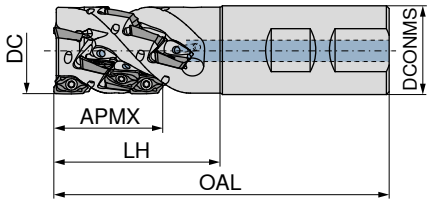
1) İçten soğutmasız.

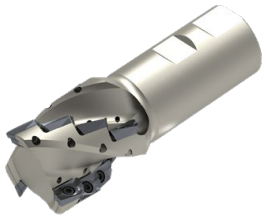
	Tork çubuğu	T – anahtar	D-Anahtar	Tesbit vidası Power	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
25 - 32	**054**		**128**		**303**	**839**	**193**
40	**054**	**040**	**128**	**151**	**303**	**839**	**193**
50	**054**	**050**	**128**	**154**	**303**	**839**	**193**
63 - 160	**054**		**128**		**303**	**839**	**193**

MaxiMill – 211-15KN silindirik parmak alın frezesi

▲ ZEFP = Kesici uç sayısı
▲ ZNP = diş aralığı







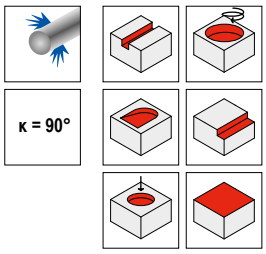


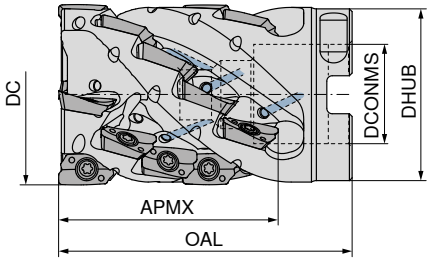
50 783 ...

Tanımlama	DC mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS mm	ZEFP	ZNP	Sıkma momenti Nm	Uç	
C211.40.R.03KN3-15-B32-60	40	3	39,6	121	60	32	9	3	3,2	XD.T 1505	**04033**
C211.50.R.03KN4-15-B40-68	50	3	52,6	138	67	40	12	4	3,2	XD.T 1505	**05034**

MaxiMill – 211-15KN Değiştirlebilir Uçlu Vals Freze

▲ ZEFP = Kesici uç sayısı
▲ ZNP = diş aralığı







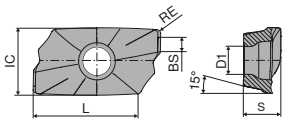
50 781 ...

Tanımlama	DC mm	ZNF	APMX mm	ZEFP	ZNP	OAL mm	DCONMS $_{H6}$ mm	DHUB mm	Sıkma momenti Nm	Uç	
A211.50.R.03KN4-15	50	3	52,6	12	4	87	27	48	3,2	XD.T 1505	**05034**
A211.50.R.03KN5-15	50	3	65,8	15	5	100	27	48	3,2	XD.T 1505	**05035**
A211.50.R.04KN5-15	50	4	65,8	20	5	100	27	48	3,2	XD.T 1505	**05045**
A211.63.R.03KN4-15	63	3	52,6	12	4	76	27	58	3,2	XD.T 1505	**06334**
A211.63.R.03KN5-15	63	3	65,8	15	5	90	27	58	3,2	XD.T 1505	**06335**
A211.63.R.04KN6-15	63	4	78,5	24	6	102	27	58	3,2	XD.T 1505	**06346**
A211.63.R.05KN5-15	63	5	65,8	25	5	90	27	58	3,2	XD.T 1505	**06355**
A211.80.R.04KN5-15	80	4	65,8	20	5	90	32	78	3,2	XD.T 1505	**08045**
A211.80.R.05KN6-15	80	5	78,5	30	6	102	32	78	3,2	XD.T 1505	**08056**

	 Silindirik vida	Tork çubuğu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 İmbus başlı vida	 Tork tornavidası.
	70 950 ...	**80 950 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar Tanımlama							
A211.50.R.03KN4-15	**002**	**054**	**128**	**303**	**20800**	**181**	**193**
A211.50.R.03KN5-15	**002**	**054**	**128**	**303**	**20800**	**181**	**193**
A211.50.R.04KN5-15	**002**	**054**	**128**	**303**	**20800**	**181**	**193**
A211.63.R.03KN4-15	**002**	**054**	**128**	**303**	**20500**	**181**	**193**
A211.63.R.03KN5-15	**002**	**054**	**128**	**303**	**20500**	**181**	**193**
A211.63.R.04KN6-15	**002**	**054**	**128**	**303**	**20500**	**181**	**193**
A211.63.R.05KN5-15	**002**	**054**	**128**	**303**	**20500**	**181**	**193**
A211.80.R.04KN5-15	**004**	**054**	**128**	**303**	**20500**	**234**	**193**
A211.80.R.05KN6-15	**004**	**054**	**128**	**303**	**20500**	**234**	**193**
C211.40.R.03KN3-15-B32-60		**054**	**128**	**303**	**20800**		**193**
C211.50.R.03KN4-15-B40-68		**054**	**128**	**303**	**20800**		**193**

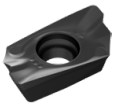
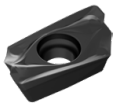
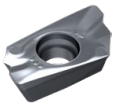
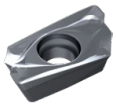
XDKT

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XDKT 150508..	9,3	4,4	14,8	1,6	5,56
XDKT 150512..	9,3	4,4	14,8	1,6	5,56
XDKT 150516..	9,3	4,4	14,8	1,6	5,56
XDKT 150520..	9,3	4,4	14,8	1,6	5,56
XDKT 150525..	9,3	4,4	14,8	1,6	5,56
XDKT 150530..	9,3	4,4	14,8	1,6	5,56
XDKT 150532..	9,3	4,4	14,8	1,9	5,56
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XDKT 150560..	9,3	4,4	14,8	-	5,56

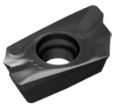
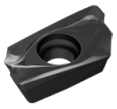
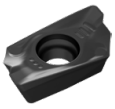
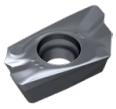
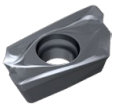
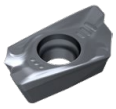


XDKT

XDKT

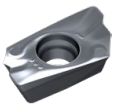
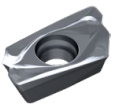
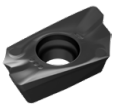
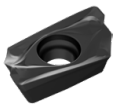
		-F50 CTCP220	-M50 CTCP220	-F50 CTPP225	-M50 CTPP225
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
		F	M	F	M
		XDKT	XDKT	XDKT	XDKT
		51 035 ...	51 038 ...	51 035 ...	51 038 ...
ISO	RE mm				
150508SR	0,8	258	258	058	058
P		●	●	●	●
M					
K					
N					
S					
H					
O					

XDKT

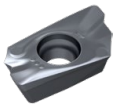
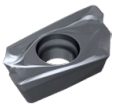
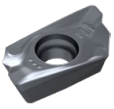
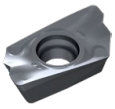
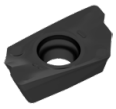
		-F50 CTCP230	-M50 CTCP230	-R50 CTCP230	-F50 CTPP235	-M50 CTPP235	-R50 CTPP235
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
		F	M	R	F	M	R
		XDKT	XDKT	XDKT	XDKT	XDKT	XDKT
		51 035 ...	51 038 ...	51 040 ...	51 035 ...	51 038 ...	51 040 ...
ISO	RE mm						
150508SR	0,8	008	008	008	108	108	108
150512SR	1,2		012			112	
150516SR	1,6		016			116	
150520SR	2,0			020		120	120
150530SR	3,0		030 1)			130 1)	
150540SR	4,0		040 1)			140 1)	
P		●	●	●	●	●	●
M					○	○	○
K		○	○	○	○	○	○
N							
S							
H							
O							

1) Uç radyusu > 2,5 mm: Freze gövdesini modifiye ediniz!

XDKT

		-F50 CTPM225 DRAGONSKIN	-M50 CTPM225 DRAGONSKIN	-F50 CTCM235 DRAGONSKIN	-M50 CTCM235 DRAGONSKIN
					
		F XDKT	M XDKT	F XDKT	M XDKT
		51 035 ...	51 038 ...	51 035 ...	51 038 ...
ISO	RE mm				
150508SR	0,8	208	208	308	308
P		●	●	●	●
M		●	●	●	●
K					
N					
S					
H					
O					

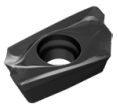
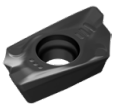
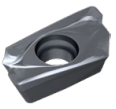
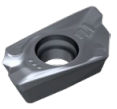
XDKT

		-F50 CTPM240 DRAGONSKIN	-M50 CTPM240 DRAGONSKIN	-R50 CTPM240 DRAGONSKIN	-F40 CTPM245 DRAGONSKIN	-F40 CTCM245 DRAGONSKIN
						
		F XDKT	M XDKT	R XDKT	F XDKT	F XDKT
		51 035 ...	51 038 ...	51 040 ...	51 114 ...	51 114 ...
ISO	RE mm					
150508ER	0,8				458	90801
150508SR	0,8	408	408	408		
150512ER	1,2					91201
150512SR	1,2		412			
150516ER	1,6					91601
150516SR	1,6		416			
150520ER	2,0					92001
150525ER	2,5					92501
150530SR	3,0		430 1)			
150532ER	3,2				482 1)	93201 1)
150540ER	4,0				490 1)	94001 1)
150540SR	4,0		440 1)			
150560ER	6,0					96001 1)
P		○	○	○	●	●
M		●	●	●	●	●
K						
N						
S						○
H						
O						

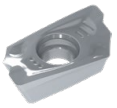
1) Uç radyusu > 2,5 mm: Freze gövdesini modifiye ediniz!

15

XDKT

	-M50 CTCK215	-R50 CTCK215	-M50 CTPK220	-R50 CTPK220	-F20 CTWN215
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	
					
	M	R	M	R	F
	XDKT	XDKT	XDKT	XDKT	XDKT
	51 038 ...	51 040 ...	51 038 ...	51 040 ...	50 479 ...
ISO / RE mm					
150508FR 0,8					508
150508SR 0,8	508	508	608	608	
P					
M					
K	●	●	●	●	○
N					●
S					
H					
O					○

XDKT

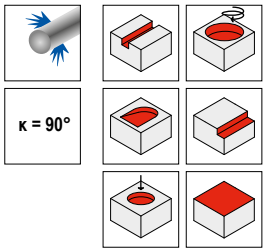
	-F40 CTC5240	-F40 CTCS245	-R60 CTP6215
	DRAGONSKIN	DRAGONSKIN	
			
	F	F	R
	XDKT	XDKT	XDKT
	50 473 ...	51 114 ...	50 469 ...
ISO / RE mm			
150508ER 0,8	508	558	
150508SR 0,8			300
150532ER 3,2	532 [1]	58201[1]	
150540ER 4,0	540 [1]	59000[1]	
P			
M			
K			●
N			
S	●	●	
H			●
O			

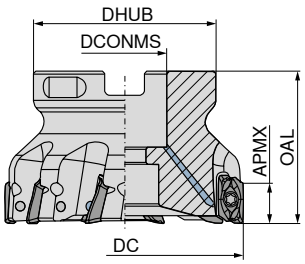
1) Uç radyusu > 2,5 mm: Freze gövdesini modifiye ediniz!

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 162
Başlangıç parametreleri	→ 162	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – 211-20 Köşe freze





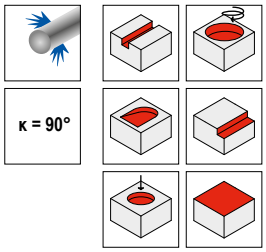


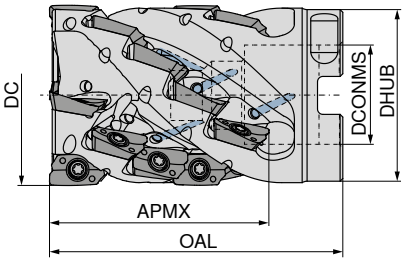
50 778 ...

Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DCONMS $_{H6}$ mm	DHUB mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
A211.63.R.05-20	63	5	19	45	22	48	14400	5	XD.. 2007..	**06305**
A211.80.R.06-20	80	6	19	50	27	58	12400	5	XD.. 2007..	**08006**
A211.100.R.07-20	100	7	19	50	32	78	10900	5	XD.. 2007..	**10007**

MaxiMill – 211-20K Değiştirlebilir Uçlu Vals Freze

▲ ZEFP = Kesici uç sayısı
▲ ZNP = diş aralığı







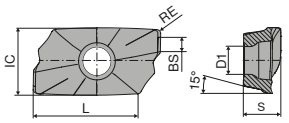
50 780 ...

Tanımlama	DC mm	ZNF	APMX mm	ZEFP	ZNP	OAL mm	DCONMS $_{H6}$ mm	DHUB mm	Sıkma momenti Nm	Uç	
A211.63.R.04K4-20	63	4	68	16	4	92	27	58	5	XD.. 2007..	**06304**
A211.80.R.05K4-20	80	5	68	20	4	92	32	76	5	XD.. 2007..	**08005**

	 Silindirik vida	Tork çubuğu	D-Anahtar	 Vida Gresi	 Sıkma vidası	 İmbus başlı vida	 Tork tornavidası.
	70 950 ...	**80 950 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
63		**037**	**106**	**303**	**01200**	**180**	**193**
80		**037**	**106**	**303**	**01200**	**181**	**193**
63	**003**	**037**	**106**	**303**	**01200**	**181**	**193**
80	**004**	**037**	**106**	**303**	**01200**	**234**	**193**
100		**037**	**106**	**303**	**01200**		**193**

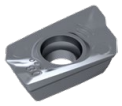
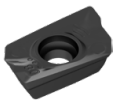
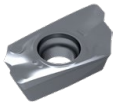
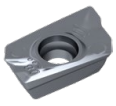
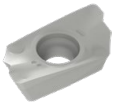
XDKT

Tanımlama	IC	D1	L	S
	mm	mm	mm	mm
XDKT 200708..	12,5	5,5	18,8	6,93
XDKT 200716..	12,5	5,5	18,8	6,89
XDKT 200732..	12,5	5,5	18,8	6,82
XDKT 200740..	12,5	5,5	18,8	6,80
XDKT 200760..	12,5	5,5	18,8	6,80



XDKT

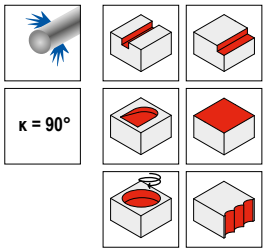
XDKT

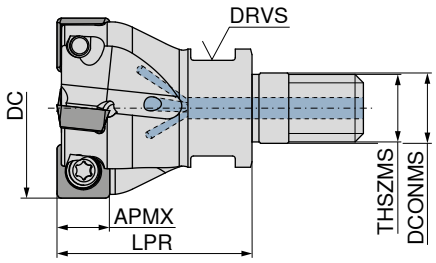
		-M50 CTPP235	-M50 CTCP230	-F40 CTPM245	-F40 CTCM245	-M50 CTPK220	-F40 CTC5240	-F40 CTCS245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
								
		M	M	F	F	M	F	F
		XDKT	XDKT	XDKT	XDKT	XDKT	XDKT	XDKT
		51 145 ...	51 145 ...	51 127 ...	51 127 ...	51 145 ...	51 127 ...	51 127 ...
ISO	RE mm							
200708ER	0,8	10800	00800	45800	90801	60800	15800	55800
200716ER	1,6	11600	01600	46600	91601	61600	16600	56600
200732ER	3,2			48200	93201		18200	58200
200740ER	4,0				94001		19000	
200760ER	6,0				96001		19200	
P		●	●	●	●			
M		○		●	●			
K		○	○			●		
N								
S					○		●	●
H								
O								

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 163
Başlangıç parametreleri	→ 163	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – 490-09 Vidalı freze

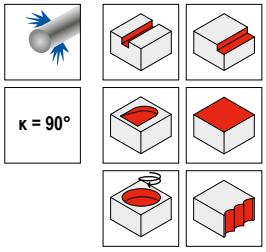


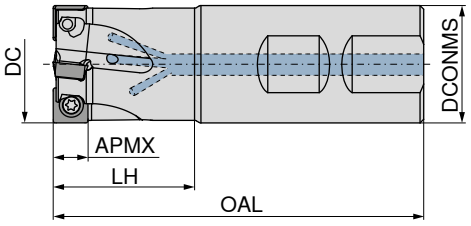




Tanımlama	DC mm	ZNF	APMX mm	LPR mm	THSZMS	DCONMS mm	DRVS mm	Sıkma momenti Nm	Uç	50 726 ...
G490.25.R.03-09	25	3	8	35	M12	12,5	17	3,2	SD.. 09T3..	025
G490.32.R.04-09	32	4	8	35	M16	17,0	24	3,2	SD.. 09T3..	032

MaxiMill – 490-09 Parmak freze

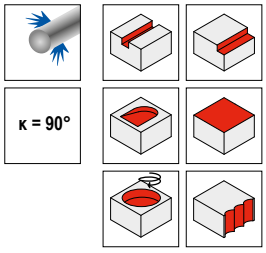


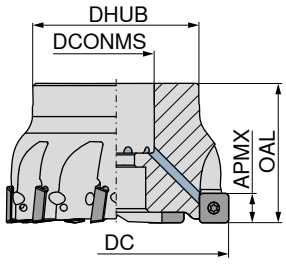


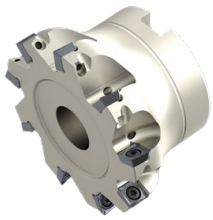


Tanımlama	DC mm	ZNF	APMX mm	DCONMS mm	OAL mm	LH mm	Sıkma momenti Nm	Uç	50 727 ...	50 727 ...
C490.25.R.03-09-B-32	25	3	8	25	88	32	3,2	SD.. 09T3..		025
C490.25.R.02-09-A-20	25	2	8	20	165	40	3,2	SD.. 09T3..	225	
C490.25.R.02-09-A-40-165	25	2	8	25	165	40	3,2	SD.. 09T3..	125	
C490.32.R.04-09-B-25	32	4	8	25	100	40	3,2	SD.. 09T3..		132
C490.32.R.04-09-B-40	32	4	8	32	100	40	3,2	SD.. 09T3..		032

MaxiMill – 490-09 Köşe freze



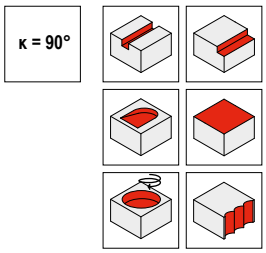


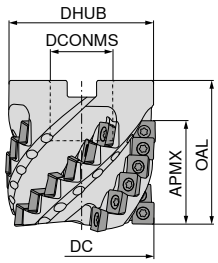


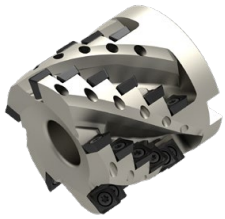
Tanımlama	DC mm	ZNF	APMX mm	DHUB mm	DCONMS H6 mm	OAL mm	Sıkma momenti Nm	Uç	50 728 ...
A490.40.R.05-09	40	5	8	38	16	40	3,2	SD.. 09T3..	040
A490.42.R.06-09	42	6	8	38	16	40	3,2	SD.. 09T3..	042
A490.50.R.06-09	50	6	8	43	22	40	3,2	SD.. 09T3..	050
A490.52.R.07-09	52	7	8	43	22	40	3,2	SD.. 09T3..	052
A490.63.R.07-09	63	7	8	48	22	40	3,2	SD.. 09T3..	063
A490.66.R.08-09	66	8	8	48	22	40	3,2	SD.. 09T3..	066
A490.80.R.09-09	80	9	8	58	27	50	3,2	SD.. 09T3..	080
A490.100.R.10-09	100	10	8	78	32	50	3,2	SD.. 09T3..	100

MaxiMill – 490-09K Değiştirlebilir Uçlu Vals Freze

▲ ZEFP = Kesici uç sayısı
▲ ZNP = diş aralığı





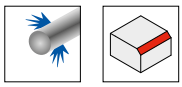


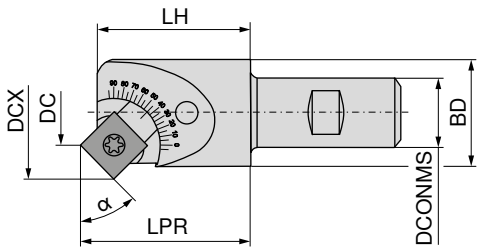
50 761 ...

Tanımlama	DC mm	ZNF	APMX mm	ZEFP	ZNP	OAL mm	DCONMS H6 mm	DHUB mm	Sıkma momenti Nm	Uç	
A490.40.R.03K6-09	40	3	41	18	6	55	16	38	3,2	SD.. 09T3..	**040**
A490.50.R.04K6-09	50	4	41	24	6	55	22	48	3,2	SD.. 09T3..	**050**
A490.63.R.05K6-09	63	5	41	30	6	60	27	61	3,2	SD.. 09T3..	**063**

	Tork çubuğu	 T – anahtar	D-Anahtar	 Tesbit vidası Power	 Vida Gresi	 Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar DC							
25 - 32	**036**		**113**		**303**	**110**	**192**
40 - 42	**036**	**040**	**113**	**151**	**303**	**110**	**192**
50 - 100	**036**		**113**		**303**	**110**	**192**

MaxiMill – 490-09 Ayarlanabilir açılı freze







NEW



50 690 ...

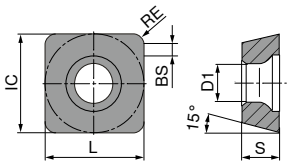
Tanımlama	DC mm	DCX mm	LH mm	BD mm	LPR mm	ZNF	DCONMS mm	Sıkma momenti Nm	Uç	
C490.20.R.01	1,6 - 11,1	20,1 - 23,6	32	18,65	32,9 - 34,6	1	16	3,2	SD.. 09T3..	**01600**

	 Silindirik vida	 Ayar parçası	Tork çubuğu	D-Anahtar	 Vida Gresi	 Sıkma vidası	Tork tornavidası.
	70 950 ...	**70 950 ...**	**80 950 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar için Ürün kodu							
50 690 01600	**87500**	**87200**	**036**	**113**	**303**	**110**	**192**

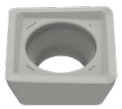
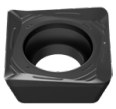
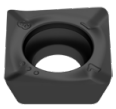
Açıya bağlı boyutlar için bkz. → **sayfa 164**

SDHT / SDNT

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
SD.T 09T3..	9,52	4,4	9,52	2,5	3,97

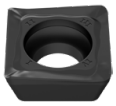
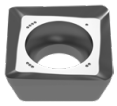


SDHT / SDNT

	TCM10	-29 CTCP230	CTPP235	-29 CTPP235	-33 CTPM240	-F50 CTPM245	-F50 CTCM245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
	CERMET						
	SDHT	SDNT	SDNT	SDNT	SDNT	SDNT	SDNT
	50 424 ...	51 011 ...	51 082 ...	51 011 ...	51 030 ...	51 111 ...	51 111 ...
ISO RE mm							
09T308ER 0,8			108			458	90801
09T308SR 0,8	900	008		108	408		
P	●	●	●	●	○	●	●
M			○	○	●	●	●
K	○	○	○	○			
N							
S							○
H							
O							

SDNT / SDHT

NEW

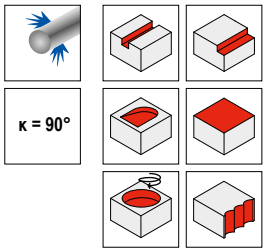
	-31 CTCK215	-F10 CTPX715	-27P H216T	-27 CTC5240	-M31 CTC5240	-F10 CTCS245
	DRAGONSKIN	DRAGONSKIN		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
						
	SDNT	SDHT	SDHT	SDHT	SDNT	SDHT
	51 029 ...	51 125 ...	50 424 ...	50 496 ...	50 425 ...	51 125 ...
ISO RE mm						
09T308ER 0,8				508	508	55800
09T308FR 0,8		00802	550			
09T308SR 0,8	508					
P		○				
M		○				
K	●	●	○			
N		●	●			
S		○		●	●	●
H						
O		○	○			

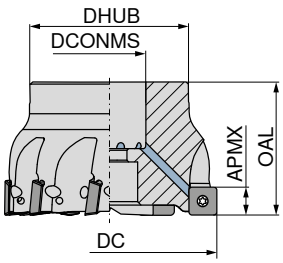
15

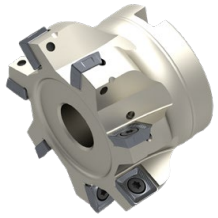
Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Başlangıç parametreleri	→ 164
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

MaxiMill – 490-12 Köşe freze





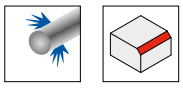


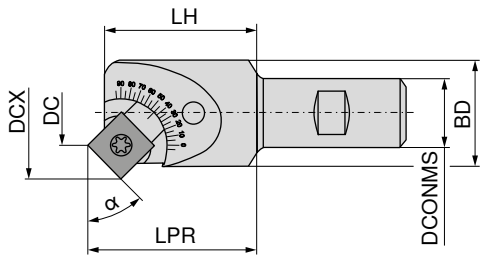
50 703 ...

Tanımlama	DC mm	ZNF	APMX mm	DHUB mm	DCONMS mm	OAL mm	Sıkma momenti Nm	Uç	
A490.40.R.04-12	40	4	11	38	16	40	5	SD.. 1205..	**54000**
A490.50.R.05-12	50	5	11	43	22	40	5	SD.. 1205..	**550**
A490.63.R.06-12	63	6	11	48	22	40	5	SD.. 1205..	**563**
A490.80.R.07-12	80	7	11	58	27	50	5	SD.. 1205..	**580**
A490.100.R.08-12	100	8	11	75	32	50	5	SD.. 1205..	**600**
A490.125.R.10-12	125	10	11	88	40	63	5	SD.. 1205..	**625**

	Tork çubuğu	 T – anahtar	 D-Anahtar	 Tesbit vidası Power	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
40	**037**	**040**	**114**	**151**	**303**	**01200**	**193**
50	**037**	**040**	**114**	**154**	**303**	**01200**	**193**
63 - 125	**037**	**040**	**114**		**303**	**01200**	**193**

MaxiMill – 490-12 Ayarlanabilir açılı freze







NEW



50 690 ...

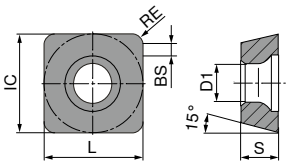
Tanımlama	DC mm	DCX mm	LH mm	BD mm	LPR mm	ZNF	DCONMS mm	Sıkma momenti Nm	Uç	
C490.26.R.01	1,1 - 14,1	26,6 - 31,5	37	25	38,2 - 40,6	1	20	5	SD.. 1205..	**02000**

	 Silindirik vida	 Ayar parçası	Tork çubuğu	D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	70 950 ...	**70 950 ...**	**80 950 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar için Ürün kodu							
50 690 02000	**87400**	**87300**	**037**	**114**	**303**	**01200**	**193**

Açıya bağlı boyutlar için bkz. → **sayfa 165**

SDHW / SDMT / SDHT

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
SDH. 120508..	12,7	5,5	12,7	2,2	5,00
SDHT 120512..	12,7	5,5	12,7	1,8	5,00
SDHT 120520..	12,7	5,5	12,7	1,0	5,00
SDHT 120525..	12,7	5,5	12,7	1,5	5,00
SDMT 120508..	12,7	5,5	12,7	3,0	5,00
SDMT 1205ZZ..	12,7	5,5	12,7	0,9	5,00

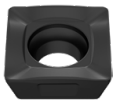
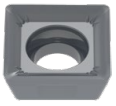
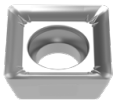
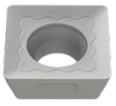


SDHW / SDMT / SDHT

	TCM10	-29 CTCP230	-29 CTPP235	-29 CTPM240	-33 CTPM240	-F50 CTPM245	-F50 CTCM245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
	CERMET						
	SDHW	SDMT	SDMT	SDMT	SDHT	SDMT	SDMT
	50 428 ...	51 081 ...	51 081 ...	51 081 ...	51 028 ...	51 110 ...	51 110 ...
ISO / RE mm							
120508ER 0,8						458	90801
120508SR 0,8	901						
120512SR 1,2					412		
120520SR 2,0					421		
1205ZZSN 0,8		020	120	420			
P	●	●	●	○	○	●	●
M			○	●	●	●	●
K	○	○	○				
N							
S							○
H							
O							

SDMT / SDHT

NEW

	-31 CTCK215	-F10 CTPX715	-27P H216T	-M31 CTC5240	-F50 CTCS245
	DRAGONSKIN	DRAGONSKIN		DRAGONSKIN	DRAGONSKIN
					
	SDMT	SDHT	SDHT	SDMT	SDMT
	51 059 ...	51 161 ...	50 426 ...	50 580 ...	51 110 ...
ISO / RE mm					
120508ER 0,8				508	55800
120508FR 0,8		00802	555		
120525FR 2,5			559		
1205ZZSN 0,8	521				
P		○			
M		○			
K	●	●	○		
N		●	●		
S		○		●	●
H					
O		○	○		

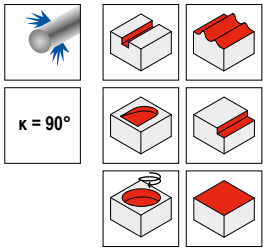
Frezeleme rehberi

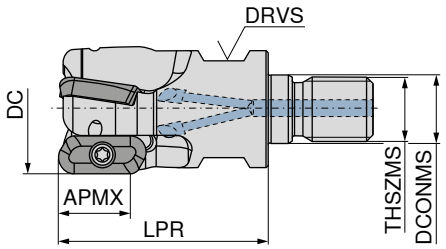
Kesme değerleri tablosu	→ 145–148	Başlangıç parametreleri	→ 165
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

15

MaxiMill – HSC-11 Vidalı freze

▲ Uç radyusu > 3,2 mm: Freze gövdesini modifiye ediniz!



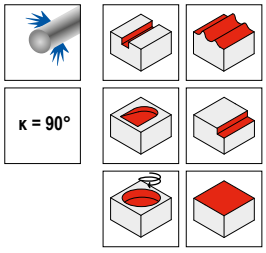


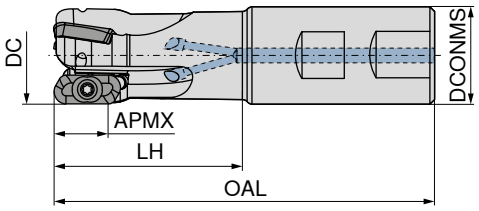


Tanımlama	DC mm	ZNF	APMX mm	DCONMS mm	LPR mm	THSZMS	RPMX 1/min.	DRVS mm	Sıkma momenti Nm	Uç	55 107 ...
GHSC.16.R.02-11	16	2	10	8,5	27	M8	56000	10	1,8	XDHT 11T3..	**016**
GHSC.20.R.02-11	20	2	10	10,5	33	M10	50100	15	1,8	XDHT 11T3..	**020**
GHSC.25.R.03-11	25	3	10	12,5	35	M12	45000	17	1,8	XDHT 11T3..	**025**
GHSC.32.R.03-11	32	3	10	17,0	35	M16	39800	24	1,8	XDHT 11T3..	**032**
GHSC.40.R.03-11	40	3	10	17,0	35	M16	35500	24	1,8	XDHT 11T3..	**040**

MaxiMill – HSC-11 Parmak freze

▲ Uç radyusu > 3,2 mm: Freze gövdesini modifiye ediniz!



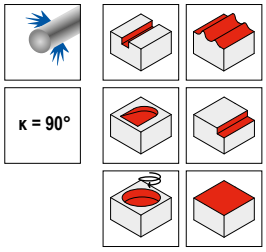


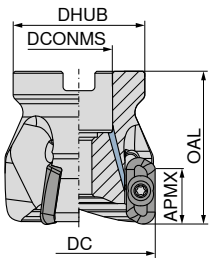


Tanımlama	DC mm	ZNF	APMX mm	DCONMS h6 mm	OAL mm	LH mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 675 ...	50 675 ...
CHSC.16.R.02-11-B/A-25	16	2	10	16	75	25	56200	1,8	XDHT 11T3..	**016**	**416**
CHSC.16.R.02-11-A-32	16	2	10	16	165	32	18800	1,8	XDHT 11T3..	**116**	
CHSC.20.R.02-11-A-32	20	2	10	20	84	32	50100	1,8	XDHT 11T3..	**020**	
CHSC.20.R.03-11-B-32	20	3	10	20	84	32	50100	1,8	XDHT 11T3..		**420**
CHSC.20.R.02-11-A-40	20	2	10	20	165	40	26700	1,8	XDHT 11T3..	**120**	
CHSC.25.R.03-11-A-40	25	3	10	25	98	40	45000	1,8	XDHT 11T3..	**225**	
CHSC.25.R.04-11-B-40	25	4	10	25	98	40	45000	1,8	XDHT 11T3..		**425**
CHSC.25.R.02-11-A-50	25	2	10	25	165	50	31700	1,8	XDHT 11T3..	**125**	
CHSC.25.R.03-11-A-50	25	3	10	25	165	50	31700	1,8	XDHT 11T3..	**325**	

MaxiMill – HSC-11 Köşe freze

▲ Uç radyusu > 3,2 mm: Freze gövdesini modifiye ediniz!







50 718 ...

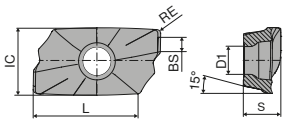
Tanımlama	DC mm	ZNF	APMX mm	DCONMS $_{H6}$ mm	DHUB mm	OAL mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
AHSC.40.R.04-11	40	4	10	16	38	50	35500	1,8	XDHT 11T3..	**040**
AHSC.50.R.04-11	50	4	10	22	43	50	31800	1,8	XDHT 11T3..	**050**
AHSC.63.R.05-11	63	5	10	22	43	50	28300	1,8	XDHT 11T3..	**063**
AHSC.80.R.05-11	80	5	10	27	58	50	25100	1,8	XDHT 11T3..	**080**
AHSC.100.R.05-11	100	5	10	32	78	50	22400	1,8	XDHT 11T3..	**100**

	Tork çubuğu	 T – anahtar	 D-Anahtar	 Tesbit vidası Power	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
16 - 25	**043**		**125**		**303**	**128**	**192**
32	**043**		**125**		**303**	**131**	**192**
40	**043**	**040**	**125**	**151**	**303**	**131**	**192**
50 - 63	**043**	**050**	**125**	**154**	**303**	**131**	**192**
80 - 100	**043**		**125**		**303**	**131**	**192**

15

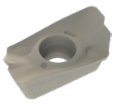
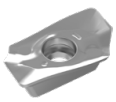
XDKT / XDHT

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XD.T 11T302FR	6,8	2,8	10,6	2	3,80
XD.T 11T304FR	6,8	2,8	10,6	1,8	3,80
XD.T 11T308FR	6,8	2,8	10,6	1,4	3,80
XD.T 11T320FR	6,8	2,8	10,6	1,4	3,80
XD.T 11T325FR	6,8	2,8	10,6	1,4	3,80
XDHT 11T312FR	6,8	2,8	10,6	1,4	3,80
XDHT 11T316FR	6,8	2,8	10,6	1,4	3,80
XDHT 11T332FR	6,8	2,8	10,6	0,8	3,80
XDHT 11T340FR	6,8	2,8	10,6	-	3,80
XDHT 11T350FR	6,8	2,8	10,6	-	3,80



XDKT

XDKT / XDHT

	-F20 CTWN215	-27P H216T
		
	F	F
	XDKT	XDHT
	50 478 ...	50 477 ...

ISO	RE		
	mm		
11T302FR	0,2	502	502
11T304FR	0,4	504	504
11T308FR	0,8	508	508
11T312FR	1,2		512
11T316FR	1,6		516
11T320FR	2,0	520 1)	520 1)
11T325FR	2,5	525 1)	525 1)
11T332FR	3,2		532 1)
11T340FR	4,0		540 1)
11T350FR	5,0		550 1)
P			
M			
K		○	○
N		●	●
S			
H			
O		○	○

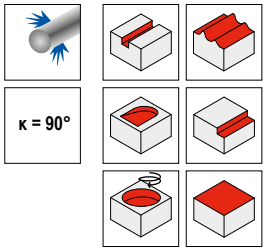
1) Uç radyusu > 1,6 mm: Freze gövdesini modifiye ediniz!

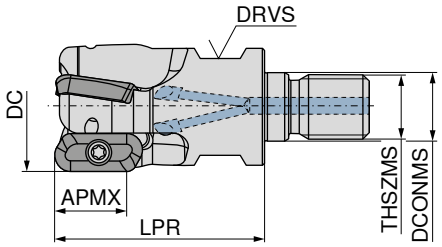
Frezeleme rehberi

Güvenlik tavsiyesi	→ 166	Kesme değerleri tablosu	→ 167
İşleme stratejisi	→ 168+169	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – HSC-19 Vidalı Freze

▲ Uç radyusu > 4,0 mm: Freze gövdesini modifiye ediniz!



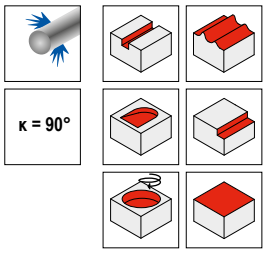


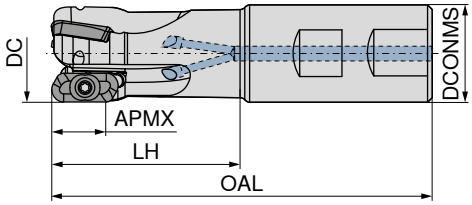


Tanımlama	DC mm	ZNF	APMX mm	DCONMS mm	LPR mm	THSZMS	DRVS mm	RPMX 1/min.	Sıkma momenti Nm	Uç	55 108 ...
GHSC.25.R.02-19	25	2	18	12,5	45	M12	17	34400	5	XDHT 1904..	**025**
GHSC.32.R.03-19	32	3	18	17,0	52	M16	24	29100	5	XDHT 1904..	**032**
GHSC.40.R.03-19	40	3	18	17,0	52	M16	24	24900	5	XDHT 1904..	**040**

MaxiMill – HSC-19 Parmak freze

▲ Uç radyusu > 4,0 mm: Freze gövdesini modifiye ediniz!



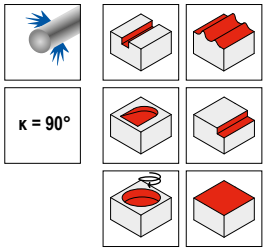


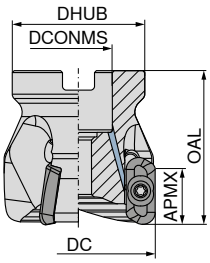


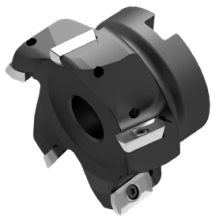
Tanımlama	DC mm	ZNF	APMX mm	DCONMS $_{h5}$ mm	OAL mm	LH mm	RPMX 1/min.	Sıkma momenti Nm	Uç	50 679 ...	50 679 ...
CHSC.25.R.02-19-A-50	25	2	18	25	121	50	32400	5	XDHT 1904..	**225**	
CHSC.25.R.02-19	25	2	18	25	121	65	32400	5	XDHT 1904..		**025**
CHSC.25.R.02-19-A-63	25	2	18	25	165	63	24700	5	XDHT 1904..	**325**	
CHSC.32.R.02-19-A-63	32	2	18	32	125	63	28900	5	XDHT 1904..	**232**	
CHSC.32.R.03-19-A-63	32	3	18	32	125	63	28900	5	XDHT 1904..	**432**	
CHSC.32.R.03-19	32	3	18	32	125	65	28900	5	XDHT 1904..		**033**
CHSC.32.R.02-19	32	2	18	32	125	65	28900	5	XDHT 1904..		**032**
CHSC.32.R.02-19-A-80	32	2	18	32	165	80	24400	5	XDHT 1904..	**332**	
CHSC.32.R.03-19-A-80	32	3	18	32	165	80	24400	5	XDHT 1904..	**532**	

MaxiMill – HSC-19 Köşe freze

▲ Uç radyusu > 4,0 mm: Freze gövdesini modifiye ediniz!







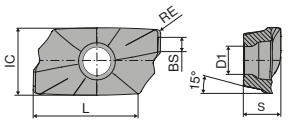
50 716 ...

Tanımlama	DC mm	ZNF	APMX mm	DCONMS $_{H6}$ mm	DHUB mm	OAL mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
AHSC.40.R.03-19	40	3	18	16	38	50	24900	5	XDHT 1904..	**040**
AHSC.50.R.04-19	50	4	18	22	43	50	21600	5	XDHT 1904..	**050**
AHSC.63.R.04-19	63	4	18	22	48	50	18800	5	XDHT 1904..	**163**
AHSC.63.R.05-19	63	5	18	22	48	50	18800	5	XDHT 1904..	**063**
AHSC.80.R.04-19	80	4	18	27	58	50	16400	5	XDHT 1904..	**180**
AHSC.80.R.05-19	80	5	18	27	58	50	16400	5	XDHT 1904..	**080**
AHSC.100.R.04-19	100	4	18	32	78	50	14500	5	XDHT 1904..	**200**
AHSC.100.R.05-19	100	5	18	32	78	50	14500	5	XDHT 1904..	**100**
AHSC.125.R.05-19	125	5	18	40	88	63	12800	5	XDHT 1904..	**125**
AHSC.125.R.06-19	125	6	18	40	88	63	12800	5	XDHT 1904..	**225**

	Tork çubuğu	 T – anahtar	D-Anahtar	 Tesbit vidası Power	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
DC							
25	**036**		**113**		**303**	**172**	**193**
32	**036**		**113**		**303**	**173**	**193**
40	**036**	**040**	**113**	**151**	**303**	**173**	**193**
50 - 63	**036**	**050**	**113**	**154**	**303**	**174**	**193**
80 - 125	**036**		**113**		**303**	**174**	**193**

XDHT

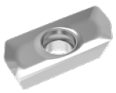
Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XDHT 190402..	9,52	4,65	19	2	4,76
XDHT 190404..	9,52	4,65	19	2	4,76
XDHT 190408..	9,52	4,65	19	2	4,76
XDHT 190412..	9,52	4,65	19	2	4,76
XDHT 190416..	9,52	4,65	19	2	4,76
XDHT 190420..	9,52	4,65	19	2	4,76
XDHT 190425..	9,52	4,65	19	1,4	4,76
XDHT 190432..	9,52	4,65	19	1	4,76
XDHT 190440..	9,52	4,65	19	1	4,76
XDHT 190450..	9,52	4,65	19	-	4,76



XDKT

XDHT

NEW

	-F10 CTPX715	-27P H216T
	DRAGONSKIN	
		
	F	F
	XDHT	XDHT
	51 159 ...	50 487 ...

ISO	RE		
	mm		
190402FR	0,2	00202	552
190404FR	0,4	00402	554
190408FR	0,8	00802	556
190412FR	1,2	01202	557
190416FR	1,6	01602	558
190420FR	2,0	02002	560
190425FR	2,5	02502	562
190432FR	3,2	03202	564
190440FR	4,0	04002	566
190450FR	5,0	05002[1)]	568 [1)]

P	○	
M	○	
K	●	○
N	●	●
S	○	
H		
O	○	○

1) Uç radyusu > 4,0 mm: Freze gövdesini modifiye ediniz!

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Güvenlik tavsiyesi	→ 166
İşleme stratejisi	→ 170–172	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

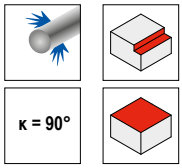
15

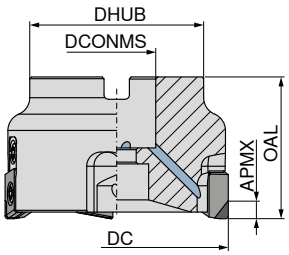
MaxiMill – HPC 12 Yüzey freze

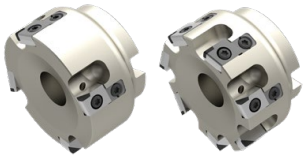
▲ 50 723 ... Normal dişli
▲ 50 724 ... Sık dişli

Teslimat kapsamı:

Takım, ayarlı baskı parçaları ve ayar anahtarı, ahşap kutu dâhil







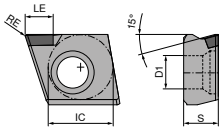
										50 723 ...		50 724 ...	
Tanımlama	DC mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç				
AHPC.40.R.04-12	40	4	11	40	34	16	32000	5	ZNHW 1205..	**040**			
AHPC.50.R.04-12	50	4	11	40	49	22	32000	5	ZNHW 1205..	**050**			
AHPC.50.R.05-12	50	5	11	40	49	22	32000	5	ZNHW 1205..				**050**
AHPC.63.R.04-12	63	4	11	40	49	22	29000	5	ZNHW 1205..	**063**			
AHPC.63.R.07-12	63	7	11	40	49	22	29000	5	ZNHW 1205..				**063**
AHPC.80.R.05-12	80	5	11	50	60	27	26000	5	ZNHW 1205..	**080**			
AHPC.80.R.09-12	80	9	11	50	60	27	26000	5	ZNHW 1205..				**080**
AHPC.100.R.06-12	100	6	11	50	70	32	24000	5	ZNHW 1205..	**100**			
AHPC.100.R.12-12	100	12	11	50	70	32	24000	5	ZNHW 1205..				**100**
AHPC.125.R.08-12	125	8	11	63	72	40	22000	5	ZNHW 1205..	**125**			
AHPC.125.R.14-12	125	14	11	63	72	40	22000	5	ZNHW 1205..				**12514**
AHPC.160.R.10-12	160	10	11	63	118	40	18000	5	ZNHW 1205..	**16010**[1)]			
AHPC.160.R.16-12	160	16	11	63	118	40	18000	5	ZNHW 1205..				**16016**[1)]
AHPC.200.R.12-12	200	12	11	63	153	60	16000	5	ZNHW 1205..	**20000**[1)]			
AHPC.250.R.14-12	250	14	11	63	200	60	14000	5	ZNHW 1205..	**25014**[1)]			
AHPC.315.R.18-12	315	18	11	80	265	60	12000	5	ZNHW 1205..	**31518**[1)]			

1) İçten soğutmasız.

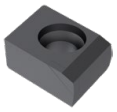
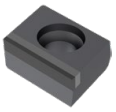
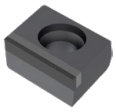
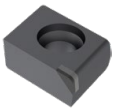
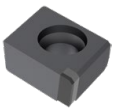
	Tork çubuğu	 Vida Gresi	 Sıkma vidası	 Altlık	 Tork tornavidası.
	80 950 ...	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar **DC**					
40 - 315	**036**	**303**	**174**	**199**	**193**

ZNHW

Tanımlama	LE	D1	IC	S
	mm	mm	mm	mm
ZNHW 120504ER-1503	3	4,85	10	5,40
ZNHW 120504FR-0007	7	4,85	10	5,40
ZNHW 120508ER-1503	3	4,85	10	5,40
ZNHW 120508SR-0003	3	4,85	10	5,40
ZNHW 1205EOER-1002	2	4,85	10	5,40
ZNHW 1205POER-1511	11	4,85	10	5,40
ZNHW 1205POFR-1003	3	4,85	10	5,40
ZNHW 1205POSR-1503	3	4,85	10	5,40
ZNHW 1205POSR-1506	6	4,85	10	5,40
ZNHW 1205POSR-3003	3	4,85	10	5,40
ZNHW 1205ZZSR-5003	3	4,85	10	5,40



ZNHW

	CTL3215	CTD4205	-R CTD4205	CTD4205	-Q CTD4205
					
	CBN ZNHW	**DIAMOND** ZNHW	**DIAMOND** ZNHW	**DIAMOND** ZNHW	**DIAMOND** ZNHW
	50 515 ...	**50 467 ...**	**50 517 ...**	**50 468 ...**	**50 466 ...**
ISO RE mm					
120504ER-1503 0,4				**906**	
120504FR-0007 0,4				**904**	
120508ER-1503 0,8				**910**	
120508SR-0003 0,8				**908**	
1205EOER-1002	**952**				
1205POER-1511		**902**			
1205POFR-1003		**90600**			
1205POSR-1503		**900**			
1205POSR-1506		**90800**	**90800**		
1205POSR-3003		**904**			
1205ZZSR-5003					**900** 1)
P					
M					
K	●				
N		●	●	●	●
S					
H	○				
O		○	○	○	○

1) -Q = Geniş freze ucu

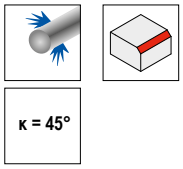
Frezeleme rehberi

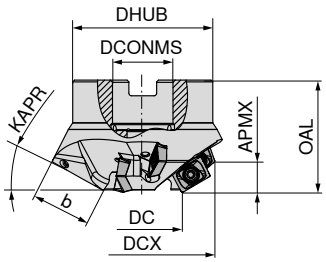
Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 173
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

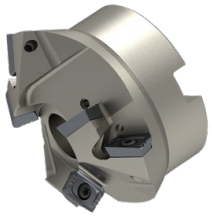
15

MaxiMill – 242 Pah Freze

▲ Dikkat : Sadece köşe radyusu 1,6 mm'den küçük uçlar kullanılmalıdır.
▲ ZEFP = Uç sayısı
▲ ZNP = Diş sayısı







NEW

50 768 ...

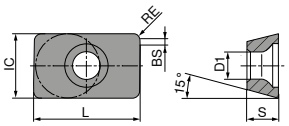
KAPR	DC mm	DCX mm	ZNF	APMX mm	ZEFP	b ±0,3 mm	OAL mm	DCONMS mm	DHUB mm	ZNP	Sıkma momenti Nm	Uç	
15°	35	89,60	3	7,0	6	27,6	50	27	62,5	2	3,2	LD.. 15...	**11503**
30°	35	83,60	3	13,6	6	27,6	50	27	62,5	2	3,2	LD.. 15...	**13003**
45°	35	74,60	3	19,3	6	27,6	50	27	62,5	2	3,2	LD.. 15...	**14503**
60°	35	62,70	3	23,6	6	27,6	50	22	49,0	2	3,2	LD.. 15...	**16003**
75°	35	49,48	3	26,7	6	27,6	60	22	49,0	2	3,2	LD.. 15...	**17503**[1)]

1) "Power tesbit vidası" ile bağlanan versiyon

	Tork çubuğu	 T – anahtar	 D-Anahtar	 Tesbit vidası Power	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.	 Tesbit vidası
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**	**83 950 ...**
Yedek parçalar								
KAPR								
15 - 60	**036**		**113**		**303**	**304**	**192**	**125**
75	**036**	**050**	**113**	**154**	**303**	**304**	**192**	

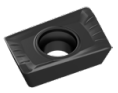
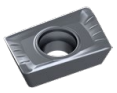
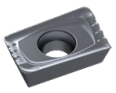
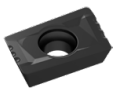
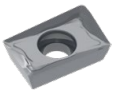
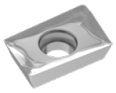
LDFT / LDFW / LDMT

Tanımlama	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
LD.. 1504PD..	9,52	4,4	15	1,2	4,76
LDFT 150408..	9,52	4,4	15	1,2	4,76
LDFT 1504PD..	9,52	4,4	15	0,8	4,76



L...

LDMT / LDFT / LDFW

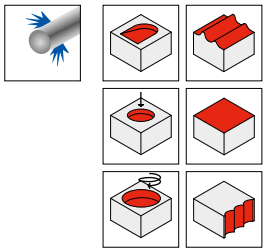
		-29 CTCP230	-29 CTPP235	-33 CTPM240	CTCK215	NEW -F10 CTPX715	-27P H216T
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	
							
		LDMT	LDMT	LDFT	LDFW	LDFT	LDFT
		51 080 ...	51 080 ...	51 042 ...	51 043 ...	51 157 ...	50 409 ...
ISO	RE mm						
150408FR	0,8					00802	550
1504PDSR	0,8	020	120		520		
1504PDSR	1,2			420			
P		●	●	○		○	
M			○	●		○	
K		○	○		●	●	○
N						●	●
S						○	
H							
O						○	○

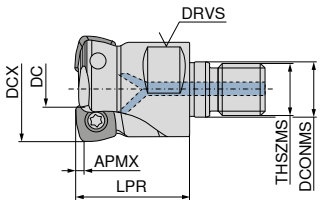
Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

15

MaxiMill – HFC yüksek ilerleme hızlı, vidalı freze

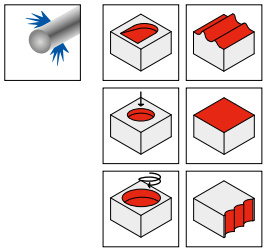


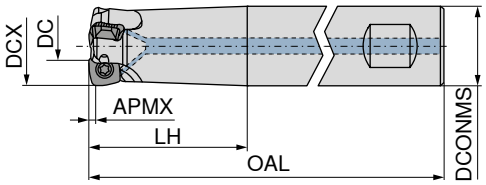




Tanımlama	DC	DCX	ZNF	APMX	LPR	DCONMS	THSZMS	DRVS	RPMX	Sıkma momenti	Uç	50 682 ...
	mm	mm		mm	mm	mm		mm	1/min.	Nm		
GHFC.16.R.02-06	7	16	2	0,8	27	8,5	M8	10	20800	1,2	XPLX 0603..	616
GHFC.20.R.03-06	11	20	3	0,8	33	10,5	M10	15	19800	1,2	XPLX 0603..	620
GHFC.25.R.04-06	16	25	4	0,8	35	12,5	M12	17	18700	1,2	XPLX 0603..	625
GHFC.32.R.05-06	23	32	5	0,8	35	17,0	M16	24	22000	1,2	XPLX 0603..	632
GHFC.42.R.07-06	33	42	7	0,8	35	17,0	M16	24	15000	1,2	XPLX 0603..	04207
GHFC.25.R.02-09	12	25	2	1,0	35	12,5	M12	17	30000	3,2	XDLX 09T3..	025
GHFC.25.R.03-09	12	25	3	1,0	35	12,5	M12	17	30000	3,2	XDLX 09T3..	125
GHFC.32.R.03-09	19	32	3	1,0	35	17,0	M16	24	27000	3,2	XDLX 09T3..	032
GHFC.42.R.05-09	19	42	5	1,0	35	17,0	M16	24	26100	3,2	XDLX 09T3..	04205
GHFC.32.R.02-12	15	32	2	2,0	35	17,0	M16	24	21600	5	XOLX 1204..	132
GHFC.35.R.03-12	18	35	3	2,0	35	17,0	M16	24	21360	5	XOLX 1204..	035
GHFC.42.R.04-12	25	42	4	2,0	35	17,0	M16	24	20800	5	XOLX 1204..	04204

MaxiMill – HFC yüksek ilerleme hızlı, parmak freze



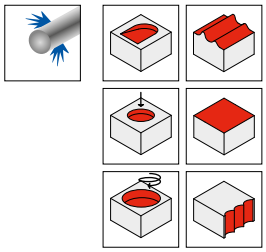


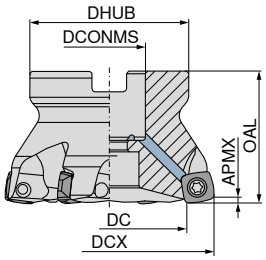


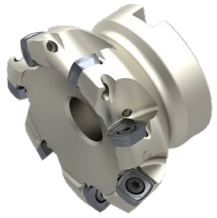


Tanımlama	DC	DCX	ZNF	APMX	OAL	LH	DCONMS $_{h6}$	RPMX	Sıkma momenti	Uç	50 681 ...	50 681 ...
	mm	mm		mm	mm	mm	mm	1/min.	Nm			
CHFC.16.R.02-06-B-40	7,0	16	2	0,8	89	40	16	17300	1,2	XPLX 0603..		616
CHFC.16.R.02-06-A-40-200	7,0	16	2	0,8	200	40	16	4600	1,2	XPLX 0603..	716	
CHFC.20.R.03-06-B-50	11,0	20	3	0,8	101	50	20	14500	1,2	XPLX 0603..		620
CHFC.20.R.03-06-A-50-225	11,0	20	3	0,8	225	50	20	4200	1,2	XPLX 0603..	720	
CHFC.25.R.04-06-B-50	16,0	25	4	0,8	107	50	25	15600	1,2	XPLX 0603..		625
CHFC.25.R.04-06-A-50-225	16,0	25	4	0,8	225	50	25	4600	1,2	XPLX 0603..	725	
CHFC.32.R.05-06-B-25-60	23,0	32	5	0,8	117	60	25	11000	1,2	XPLX 0603..		632
CHFC.32.R.05-06-A-25-60-225	23,0	32	5	0,8	225	60	25	3900	1,2	XPLX 0603..	732	
CHFC.25.R.02-09-A-50-225	12,3	25	2	1,0	225	50	25	9000	3,2	XDLX 09T3..	025	
CHFC.25.R.03-09-A-50-225	12,3	25	3	1,0	225	50	25	9000	3,2	XDLX 09T3..	125	
CHFC.32.R.03-09-A-63-250	19,3	32	3	1,0	250	63	32	8100	3,2	XDLX 09T3..	032	
CHFC.32.R.02-12-A-63-250	14,8	32	2	2,0	250	63	32	6480	5	XOLX 1204..	132	
CHFC.35.R.03-12-A-63-250	17,8	35	3	2,0	250	63	32	6480	5	XOLX 1204..	035	

MaxiMill – HFC yüksek ilerleme hızlı, takma freze







50 683 ...

Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DCONMS $_{H6}$ mm	DHUB mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
AHFC.32.R.03-09	19,3	32	3	1,0	40	16	38	27700	3,2	XDLX 09T3..	**032**
AHFC.35.R.04-09	19,3	35	4	1,0	40	16	38	26700	3,2	XDLX 09T3..	**035**
AHFC.40.R.04-09	27,3	40	4	1,0	40	16	38	26400	3,2	XDLX 09T3..	**140**
AHFC.42.R.05-09	29,3	42	5	1,0	40	16	38	26100	3,2	XDLX 09T3..	**142**
AHFC.50.R.05-09	37,3	50	5	1,0	40	22	43	23500	3,2	XDLX 09T3..	**150**
AHFC.52.R.06-09	39,3	52	6	1,0	40	22	43	23000	3,2	XDLX 09T3..	**152**
AHFC.63.R.06-09	50,3	63	6	1,0	40	22	48	20500	3,2	XDLX 09T3..	**163**
AHFC.66.R.07-09	53,3	66	7	1,0	40	22	48	20000	3,2	XDLX 09T3..	**16600**
AHFC.40.R.03-12	22,8	40	3	2,0	40	16	38	21120	5	XOLX 1204..	**040**
AHFC.42.R.04-12	24,8	42	4	2,0	40	16	38	20880	5	XOLX 1204..	**042**
AHFC.50.R.04-12	32,8	50	4	2,0	40	22	43	18800	5	XOLX 1204..	**050**
AHFC.52.R.05-12	34,8	52	5	2,0	40	22	43	18400	5	XOLX 1204..	**052**
AHFC.63.R.05-12	45,8	63	5	2,0	40	22	48	16400	5	XOLX 1204..	**063**
AHFC.66.R.06-12	48,8	66	6	2,0	40	22	48	16000	5	XOLX 1204..	**066**
AHFC.80.R.07-12	62,8	80	7	2,0	50	27	58	14000	5	XOLX 1204..	**080**
AHFC.100.R.08-12	82,8	100	8	2,0	50	32	78	12000	5	XOLX 1204..	**100**
AHFC.63.R.05-19	36,7	63	5	3,3	40	22	48	5500	5	XOLX 1906..	**263**
AHFC.80.R.06-19	53,7	80	6	3,3	50	27	58	4700	5	XOLX 1906..	**280**
AHFC.100.R.08-19	73,7	100	8	3,3	52	32	78	4100	5	XOLX 1906..	**300**
AHFC.125.R.10-19	98,7	125	10	3,3	63	40	88	3600	5	XOLX 1906..	**325**
AHFC.160.R.11-19	133,7	160	11	3,3	63	40	98	3100	5	XOLX 1906..	**360** [1]

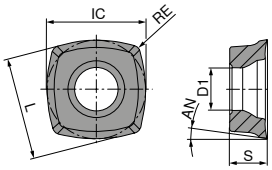
1) Ön tarafta M12 cıvata delikleri ile beraber. Bölüm dairesi = Ø66,7 mm. / İçten soğutmasız.

	Tork çubuğu	T – anahtar	D-Anahtar	Tesbit vidası Power	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
Uç							
XDLX 09T3..	**036**		**113**		**303**	**110**	**192**
XDLX 09T3.. (Ø32 – Ø42)	**036**	**040**	**113**	**151**	**303**	**304**	**192**
XOLX 1204..	**037**		**114**		**303**	**01200**	**193**
XOLX 1204.. (Ø40 – Ø42)	**037**	**040**	**114**	**151**	**303**	**01200**	**193**
XOLX 1906..	**037**		**114**		**303**	**302**	**193**
XPLX 0603..	**033**		**110**		**303**	**116**	**192**

15

XPLX / XDLX / XOLX / XOHX

Tanımlama	IC	D1	L	BS	S	AN
	mm	mm	mm	mm	mm	°
XPLX 0603..	6,35	2,8	6	1	2,75	11
XDLX 09T3..	9,52	4,4	9	1,9	3,97	15
XO.X 1204..	12,70	5,5	12	1,3	4,76	10
XOLX 1906..	19,14	6,0	19	-	6,35	10



XPLX

		-M50 CTCP220	**-M50** CTPP225	**-M50** CTPP235	**-M50** CTPM225	**-M50** CTPM240	**-F40** CTPM245	**-F40** CTCM245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
								
		XPLX	XPLX	XPLX	XPLX	XPLX	XPLX	XPLX
		51 019 ...	**51 019 ...**	**51 019 ...**	**51 019 ...**	**51 019 ...**	**51 116 ...**	**51 116 ...**
ISO	RE mm							
060305ER	0,5						**455**	**90501**
060305SR	0,5	**255**	**055**	**105**	**205**	**405**		
P		●	●	●	●	○	●	●
M				○	●	●	●	●
K				○				
N								
S								○
H								
O								

XPLX

		-M50 CTCK215	**-F40** CTC5240	**-F40** CTCS245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
				
		XPLX	XPLX	XPLX
		51 019 ...	**50 518 ...**	**51 116 ...**
ISO	RE mm			
060305ER	0,5		**558**	**55500**
060305SR	0,5	**505**		
P				
M				
K		●		
N				
S			●	●
H				
O				

XDLX

		-M50 CTCP220 DRAGONSKIN	-M50 CTPP225 DRAGONSKIN	-M50 CTCP230 DRAGONSKIN	-M50 CTPP235 DRAGONSKIN
					
		XDLX	XDLX	XDLX	XDLX
		51 016 ...	51 016 ...	51 016 ...	51 016 ...
ISO	RE mm				
09T308SR	0,8	258	058	008	108
P		●	●	●	●
M					○
K				○	○
N					
S					
H					
O					

XDLX

		-M50 CTPM225 DRAGONSKIN	-M50 CTCM235 DRAGONSKIN	-M50 CTPM240 DRAGONSKIN	-F40 CTPM245 DRAGONSKIN	-M50 CTPM245 DRAGONSKIN	-M50 CTCM245 DRAGONSKIN
							
		XDLX	XDLX	XDLX	XDLX	XDLX	XDLX
		51 016 ...	51 016 ...	51 016 ...	51 115 ...	51 016 ...	51 016 ...
ISO	RE mm						
09T308ER	0,8				458		
09T308SR	0,8	208	308	408		458	90801
P		●	●	○	●	●	●
M		●	●	●	●	●	●
K							
N							
S							○
H							
O							

15

XDLX

		-M50 CTCK215	-F40 CTC5240	-F40 CTCS245
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
				
		XDLX	XDLX	XDLX
		51 016 ...	50 503 ...	51 115 ...
ISO	RE mm			
09T308ER	0,8		558	558
09T308SR	0,8	508		
P				
M				
K		●		
N				
S			●	●
H				
O				

XOLX

		-M50 CTCP220	-M50 CTPP225	-M50 CTCP230	-M50 CTPP235	-R50 CTPP235
		DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
						
		XOLX	XOLX	XOLX	XOLX	XOLX
		51 017 ...	51 017 ...	51 017 ...	51 017 ...	51 018 ...
ISO	RE mm					
120410SR	1,0	260	060	010	110	110
P		●	●	●	●	●
M					○	○
K				○	○	○
N						
S						
H						
O						

XOLX

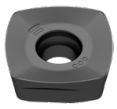
	-M50 CTPM225	-M50 CTCM235	-M50 CTPM240	-F40 CTPM245	-M50 CTPM245	-F40 CTCM245	-M50 CTCM245
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
							
	XOLX	XOLX	XOLX	XOLX	XOLX	XOLX	XOLX
	51 017 ...	51 017 ...	51 017 ...	51 022 ...	51 017 ...	51 022 ...	51 017 ...
ISO / RE mm							
120410ER 1,0				460		91001	
120410SR 1,0	210	310	410		460		91001
P	●	●	○	●	●	●	●
M	●	●	●	●	●	●	●
K							
N							
S						○	○
H							
O							

XOLX / XOHX

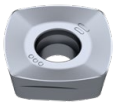
	-M50 CTCK215	-F40 CTC5240	-F50 CTC5240	-F40 CTCS245	-F50 CTCS245
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
	XOLX	XOLX	XOHX	XOLX	XOHX
	51 017 ...	50 504 ...	51 124 ...	51 022 ...	51 124 ...
ISO / RE mm					
120410ER 1,0		558		560	
120410SR 1,0	510		16000		56000
P					
M					
K	●				
N					
S		●	●	●	●
H					
O					

15

XOLX

		-M50 CTCP230 DRAGONSKIN	-M50 CTPP235 DRAGONSKIN	-M50 CTPM240 DRAGONSKIN	-F40 CTPM245 DRAGONSKIN
					
		XOLX	XOLX	XOLX	XOLX
		51 017 ...	51 017 ...	51 017 ...	51 022 ...
ISO	RE mm				
190615ER	1,5				465
190615SR	1,5	015	115	415	
P		●	●	○	●
M			○	●	●
K		○	○		
N					
S					
H					
O					

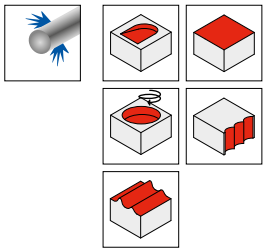
XOLX

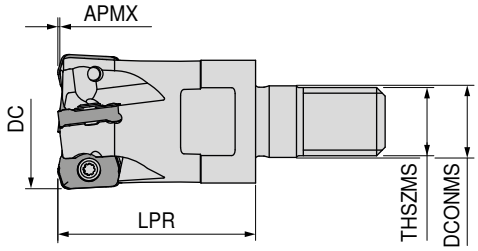
		-F40 CTCM245 DRAGONSKIN	-M50 CTCK215 DRAGONSKIN	-M50 CTPK220 DRAGONSKIN	-F40 CTC5240 DRAGONSKIN	-F40 CTCS245 DRAGONSKIN
						
		XOLX	XOLX	XOLX	XOLX	XOLX
		51 022 ...	51 017 ...	51 017 ...	50 504 ...	51 022 ...
ISO	RE mm					
190615ER	1,5	91501			515	56500
190615SR	1,5		515	61500		
P		●				
M		●				
K			●	●		
N						
S		○			●	●
H						
O						

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 176–179
Başlangıç parametreleri	→ 176–179	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

MaxiMill – DHFC yüksek ilerleme hızlı, vidalı freze



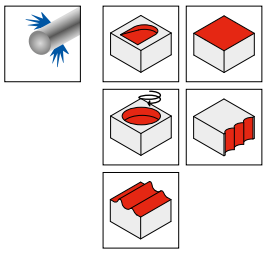


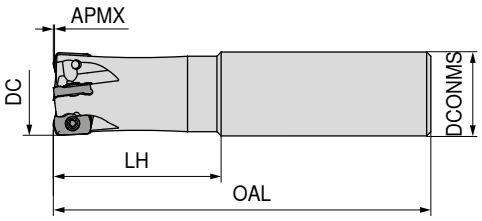


56 411 ...

Tanımlama	DC mm	ZNF	APMX mm	LPR mm	DCONMS mm	THSZMS	Sıkma momenti Nm	Uç	
GDHFC.16.R.02-09	16	2	0,75	29	8,5	M8	0,65	LNKX 0925..	**01602**
GDHFC.16.R.03-09	16	3	0,75	29	8,5	M8	0,65	LNKX 0925..	**01603**
GDHFC.20.R.04-09	20	4	0,75	29	10,5	M10	0,65	LNKX 0925..	**02004**
GDHFC.25.R.05-09	25	5	0,75	33	12,5	M12	0,65	LNKX 0925..	**02505**
GDHFC.32.R.05-09	32	5	0,75	42	17,0	M16	0,65	LNKX 0925..	**03205**
GDHFC.35.R.06-09	35	6	0,75	42	17,0	M16	0,65	LNKX 0925..	**03506**
GDHFC.42.R.06-09	42	6	0,75	42	17,0	M16	0,65	LNKX 0925..	**04206**

MaxiMill – DHFC yüksek ilerleme hızlı, parmak freze





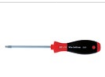




56 417 ...

Tanımlama	DC mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS $_{h6}$ mm	Sıkma momenti Nm	Uç	
CDHFC.16.R.05-09-A-32	16	3	0,75	80	32	16	0,65	LNKX 0925..	**01603**
CDHFC.20.R.04-09-A-40	20	4	0,75	90	40	20	0,65	LNKX 0925..	**02004**

Tork çubuğu
80 950 ...


D-Anahtar
80 950 ...


Vida Gresi
70 950 ...


Sıkma vidası
56 950 ...


Tork tornavidası.
80 950 ...

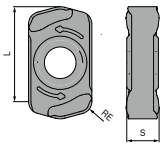
Yedek parçalar

DC				
16 - 42	**051**	**117**	**303**	**15000**	**191**

15

LNKX

Tanımlama	L mm	S mm
LNKX 0925..	9	2,50



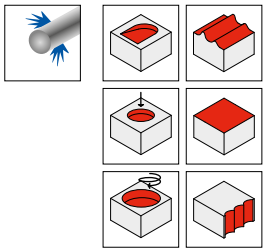
LNKX

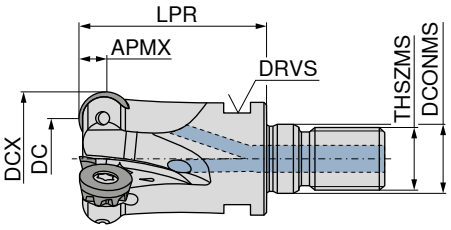
		-R50 CTPP231	-M50 CTPP236	-R50 CTPP236	-M50 CTPM241	-R50 CTPK221
						
		LNKX	LNKX	LNKX	LNKX	LNKX
		56 353 ...	56 355 ...	56 353 ...	56 355 ...	56 353 ...
ISO	RE mm					
0925ZSR	1	12000	02500	02000	42500	27000
P		●	●	●	○	○
M		○	○	○	●	
K		○	○	○		●
N						
S					○	
H						
O						

Frezeleme rehberi

Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 180
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

MaxiMill – 251 RS Vidalı freze





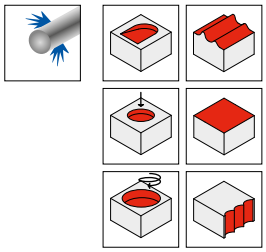


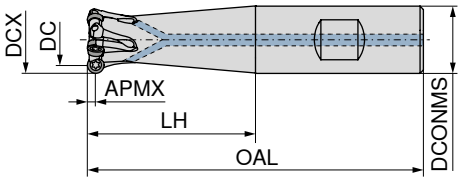
50 684 ...

Tanımlama	DC mm	DCX mm	ZNF	APMX mm	DCONMS mm	LPR mm	THSZMS	DRVS mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
G251.20.R.05-05-RS	15	20	5	2,5	10,5	33	M10	15	31800	0,7	RDHX 0501..	**220**
G251.25.R.06-05-RS	20	25	6	2,5	12,5	35	M12	17	24450	0,7	RDHX 0501..	**225**
G251.32.R.07-05-RS	27	32	7	2,5	17,0	35	M16	24	19850	0,7	RDHX 0501..	**232**
G251.20.R.03-08-RS	12	20	3	4,0	10,5	33	M10	15	25000	1,2	RDHX 0802..	**120**
G251.25.R.04-08-RS	17	25	4	4,0	12,5	35	M12	17	19000	1,2	RDHX 0802..	**125**
G251.32.R.05-08-35-RS	24	32	5	4,0	17,0	35	M16	24	19000	1,2	RDHX 0802..	**132**
G251.20.R.02-10-RS	10	20	2	5,0	10,5	33	M10	15	30000	2	RP.X 10T3..	**020**
G251.25.R.03-10-RS	15	25	3	5,0	12,5	35	M12	17	30000	2	RP.X 10T3..	**025**
G251.32.R.04-10-RS	22	32	4	5,0	17,0	35	M16	24	25000	2	RP.X 10T3..	**032**
G251.25.R.02-12-35-RS	13	25	2	6,0	12,5	35	M12	17	25000	3,2	RP.X 1204..	**525**
G251.32.R.03-12-35-RS	20	32	3	6,0	17,0	35	M16	24	19850	3,2	RP.X 1204..	**532**
G251.35.R.03-12-35-RS	23	35	3	6,0	17,0	35	M16	24	15900	3,2	RP.X 1204..	**535**
G251.42.R.04-12-42-RS	30	42	4	6,0	17,0	42	M16	24	15000	3,2	RP.X 1204..	**542**

	Tork çubuğu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar					
Uç					
RDHX 0501..	**031**	**108**	**303**	**149**	**191**
RDHX 0802..	**033**	**110**	**303**	**116**	**191**
RP.X 10T3..	**035**	**112**	**303**	**840**	**192**
RP.X 1204..	**036**	**113**	**303**	**304**	**192**

MaxiMill – 251 RS Parmak freze







Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	LH mm	DCONMS mm	RPMX 1/min.	Uç	50 685 ...	50 685 ...
C251.12.R-03-05-B-16-25-RS	7	12	3	2,5	75	25	16	40000	RDHX 0501..		**012**
C251.12.R-03-05-A-32-165-RS	7	12	3	2,5	165	32	12	16000	RDHX 0501..	**112**	
C251.16.R-04-05-B-32-RS	11	16	4	2,5	81	32	16	40000	RDHX 0501..		**316**
C251.16.R-04-05-A-40-165-RS	11	16	4	2,5	165	40	16	18000	RDHX 0501..	**016**	
C251.20.R-05-05-B-40-RS	15	20	5	2,5	91	40	20	31800	RDHX 0501..		**620**
C251.20.R-05-05-A-50-165-RS	15	20	5	2,5	165	50	20	18000	RDHX 0501..	**120**	
C251.16.R-02-08-B-32-RS	8	16	2	4,0	81	32	16	40000	RDHX 0802..		**116**
C251.16.R-02-08-A-40-165-RS	8	16	2	4,0	165	40	16	18000	RDHX 0802..	**216**	
C251.20.R-03-08-B-40-RS	12	20	3	4,0	91	40	20	31800	RDHX 0802..		**220**
C251.20.R-03-08-A-60-RS	12	20	3	4,0	110	50	20	30000	RDHX 0802..	**020**	
C251.20.R-03-08-A-50-200-RS	12	20	3	4,0	200	50	20	25000	RDHX 0802..	**320**	
C251.25.R-04-08-B-50-RS	17	25	4	4,0	107	50	25	25500	RDHX 0802..		**625**
C251.25.R-04-08-A-60-RS	17	25	4	4,0	116	60	25	19000	RDHX 0802..	**125**	
C251.25.R-04-08-A-60-225-RS	17	25	4	4,0	225	60	25	18000	RDHX 0802..	**225**	
C251.20.R-02-10-A-50-RS	10	20	2	5,0	102	50	20	25000	RP.X 10T3..	**420**	
C251.20.R-02-10-A-50-200-RS	10	20	2	5,0	200	50	20	25000	RP.X 10T3..	**520**	
C251.25.R.03-10-A-60-RS	15	25	3	5,0	116	60	25	25000	RP.X 10T3..	**025**	
C251.25.R-03-10-B-60-RS	15	25	3	5,0	116	60	25	20000	RP.X 10T3..		**325**
C251.25.R-03-10-A-60-225-RS	15	25	3	5,0	225	60	25	18000	RP.X 10T3..	**425**	
C251.32.R.04-10-A-70-RS	22	32	4	5,0	130	70	32	25000	RP.X 10T3..	**032**	
C251.25.R-02-12-B-30-RS	13	25	2	6,0	86	30	25	25000	RP.X 1204..		**525**
C251.32.R-03-12-A-RS	20	32	3	6,0	100	40	32	19000	RP.X 1204..	**232**	
C251.32.R-03-12-B-40-RS	20	32	3	6,0	100	40	32	19000	RP.X 1204..		**132**

Tork çubuğu


D-Anahtar

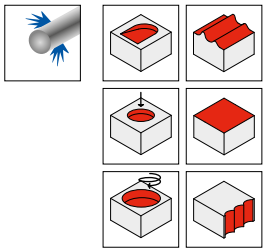

Vida Gresi

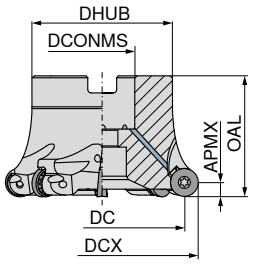

Sıkma vidası

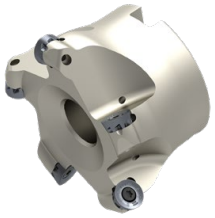

Tork tornavidası.

Yedek parçalar	80 950 ...	80 950 ...	70 950 ...	70 950 ...	80 950 ...
Uç					
RDHX 0501..	**031**	**108**	**303**	**149**	**191**
RDHX 0802..	**033**	**110**	**303**	**116**	**191**
RP.X 10T3..	**035**	**112**	**303**	**840**	**192**
RP.X 10T3..		**112**	**303**	**840**	
RP.X 1204..	**036**	**113**	**303**	**304**	**192**

MaxiMill – 251 RS Yuvarlak uçlu freze







50 686 ...

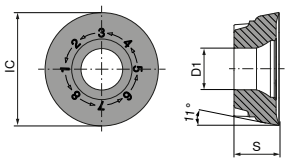
Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DHUB mm	DCONMS $_{H6}$ mm	RPMX 1/min.	Sıkma momenti Nm	Uç	
A251.40.R.03-10-RS	30	40	3	5	40	38	16	15900	2	RP.X 10T3..	**240**
A251.40.R.05-10-RS	30	40	5	5	40	38	16	16000	2	RP.X 10T3..	**140**
A251.42.R.06-10-RS	32	42	6	5	40	38	16	16000	2	RP.X 10T3..	**142**
A251.50.R.04-10-RS	40	50	4	5	40	43	22	12700	2	RP.X 10T3..	**350**
A251.50.R.06-10-RS	40	50	6	5	40	43	22	12500	2	RP.X 10T3..	**150**
A251.52.R.06-10-RS	42	52	6	5	40	43	22	12500	2	RP.X 10T3..	**152**
A251.40.R.04-12-RS	28	40	4	6	40	38	16	15900	3,2	RP.X 1204..	**340**
A251.50.R.04-12-RS	38	50	4	6	40	43	22	12700	3,2	RP.X 1204..	**250**
A251.50.R.05-12-RS	38	50	5	6	40	43	22	12500	3,2	RP.X 1204..	**050**
A251.52.R.05-12-RS	40	52	5	6	40	43	22	12500	3,2	RP.X 1204..	**052**
A251.63.R.06-12-RS	51	63	6	6	40	48	22	10000	3,2	RP.X 1204..	**063**
A251.66.R.07-12-RS	54	66	7	6	40	48	22	9000	3,2	RP.X 1204..	**166**
A251.80.R.05-12-RS	68	80	5	6	50	58	27	7950	3,2	RP.X 1204..	**180**
A251.80.R.07-12-RS	68	80	7	6	50	58	27	8000	3,2	RP.X 1204..	**080**
A251.100.R.06-12-RS	88	100	6	6	50	78	32	6350	3,2	RP.X 1204..	**100**
A251.100.R.10-12-RS	88	100	10	6	50	78	32	6350	3,2	RP.X 1204..	**200**
A251.50.R.04-16-RS	34	50	4	8	40	48	22	12700	5	RP.X 1605..	**450**
A251.52.R.04-16-RS	36	52	4	8	40	48	22	10100	5	RP.X 1605..	**452**
A251.63.R.05-16-RS	47	63	5	8	40	48	22	10100	5	RP.X 1605..	**163**
A251.66.R.05-16-RS	50	66	5	8	40	48	22	7950	5	RP.X 1605..	**466**
A251.80.R.06-16-RS	64	80	6	8	50	58	27	7950	5	RP.X 1605..	**280**
A251.100.R.07-16-RS	84	100	7	8	50	78	32	6350	5	RP.X 1605..	**300**
A251.125.R.08-16-RS	109	125	8	8	63	88	40	5050	5	RP.X 1605..	**225**
A251.80.R.05-20-RS	60	80	5	10	50	58	27	7950	5	RP.X 2006..	**380**
A251.100.R.06-20-RS	80	100	6	10	50	78	32	6350	5	RP.X 2006..	**400**
A251.125.R.06-20-RS	105	125	6	10	63	88	40	5050	5	RP.X 2006..	**125**

	Tork çubuğu	 T – anahtar	D-Anahtar	 Tesbit vidası Power	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
Uç							
RP.X 10T3..	**035**	**040**	**112**	**151**	**303**	**840**	**192**
RP.X 1204..	**036**	**040**	**113**	**151**	**303**	**304**	**192**
RP.X 1605..	**037**	**050**	**114**	**154**	**303**	**01200**	**193**
RP.X 2006..	**037**		**114**		**303**	**302**	**193**

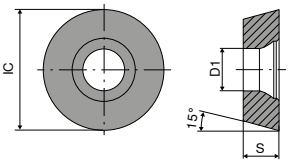
15

RDHX / RPHX / RPNX

Tanımlama	IC mm	D1 mm	S mm
RDHX 0501..	5	2,5	1,59
RDHX 0802..	8	2,8	2,38
RP.X 10T3..	10	3,4	3,97
RP.X 1204..	12	4,4	4,76
RP.X 1605..	16	5,5	5,56
RP.X 2006..	20	6,0	6,35



RP.X 10T3.. / RP.X 1204.. / RP.X 1605.. / RPNX 2006..

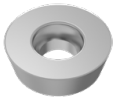


RDHX 0501.. / RDHX0802..

RDHX

	-SN CTCP230	-SN CTPP235	-F50 CTPM240	-F50 CTPM245	-F50 CTCM245
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
					
	RDHX	RDHX	RDHX	RDHX	RDHX
	51 048 ...	51 048 ...	51 083 ...	51 083 ...	51 083 ...
ISO					
0501M0SN	020	120		465	
0802M0SN	025	125	420	470	92001
0802M4SN				471	92101
P	●	●	○	●	●
M		○	●	●	●
K	○	○			
N					
S					○
H					
O					

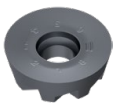
RDHX

	-FN H216T	-M31 CTC5240	-F50 CTCS245
		DRAGONSKIN	DRAGONSKIN
			
	RDHX	RDHX	RDHX
	50 481 ...	50 481 ...	51 083 ...
ISO			
0501M0FN	600		
0802M0EN		500	
0802M0FN	602		
0802M0SN			570
0802M4EN		50100	
P			
M			
K	○		
N	●		
S		●	●
H			
O	○		

RPHX / RPNX

	-SN TCM10	-F50 CTCP230 DRAGONSKIN	-M50 CTCP230 DRAGONSKIN	-SN CTCP230 DRAGONSKIN	-SN CTCP230 DRAGONSKIN
					
	CERMET				
	RPHX	RPNX	RPNX	RPHX	RPNX
	50 483 ...	51 055 ...	51 054 ...	51 052 ...	51 057 ...
ISO					
10T3M0SN	900				
10T3M8SN		020	020	020	
1204M0SN	902				
1204M8SN		025	025	025	025
1605M8SN			030	030	030
2006M8SN					035
P	●	●	●	●	●
M					
K	○	○	○	○	○
N					
S					
H					
O					

RPHX / RPNX

	-F50 CTPP235 DRAGONSKIN	-F50 CTPP235 DRAGONSKIN	-M30 CTPP235 DRAGONSKIN	-M30 CTPP235 DRAGONSKIN
				
	RPHX	RPNX	RPHX	RPNX
	51 051 ...	51 055 ...	51 049 ...	51 053 ...
ISO				
10T3M8EN			120	
10T3M8SN	12000	120		
1204M8SN	125	125		
1605M0SN		130		
2006M8EN				120
P	●	●	●	●
M	○	○	○	○
K	○	○	○	○
N				
S				
H				
O				

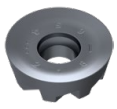
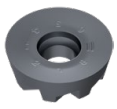
RPNX / RPHX

	-M50 CTPP235 DRAGONSKIN	-M50 CTPP235 DRAGONSKIN	-SN CTPP235 DRAGONSKIN	-SN CTPP235 DRAGONSKIN
				
	RPNX	RPHX	RPHX	RPNX
	51 054 ...	51 050 ...	51 052 ...	51 057 ...
ISO				
10T3M8SN	12000	12000	120	
1204M8SN	125		125	125
1605M8SN	130		130	130
2006M8SN				135
P	●	●	●	●
M	○	○	○	○
K	○	○	○	○
N				
S				
H				
O				

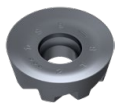
RPHX

	-F50 CTPM225 DRAGONSKIN	-M30 CTPM225 DRAGONSKIN	-SN CTPM225 DRAGONSKIN	-F50 CTCM235 DRAGONSKIN	-M30 CTCM235 DRAGONSKIN
					
	RPHX	RPHX	RPHX	RPHX	RPHX
	51 051 ...	51 049 ...	51 052 ...	51 051 ...	51 049 ...
ISO					
1204M8EN		225			325
1204M8SN	225		225	325	
P	●	●	●	●	●
M	●	●	●	●	●
K					
N					
S					
H					
O					

RPHX / RPNX

	-F50 CTPM240 DRAGONSKIN	-F50 CTPM240 DRAGONSKIN	-M30 CTPM240 DRAGONSKIN	-M30 CTPM240 DRAGONSKIN	-M50 CTPM240 DRAGONSKIN
					
	RPHX	RPNX	RPHX	RPNX	RPHX
	51 051 ...	51 055 ...	51 049 ...	51 053 ...	51 050 ...
ISO					
10T3M8EN			420		
10T3M8SN	420				420
1204M8EN			425		
1204M8SN	425				425
1605M8EN			430		
1605M8SN	430				
2006M8EN				420	
2006M8SN		435			
P	○	○	○	○	○
M	●	●	●	●	●
K					
N					
S					
H					
O					

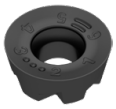
RPHX / RPNX

	CTPM245 DRAGONSKIN	-F50 CTPM245 DRAGONSKIN	-F50 CTPM245 DRAGONSKIN	-M32 CTPM245 DRAGONSKIN	-M50 CTPM245 DRAGONSKIN
					
	RPHX	RPHX	RPNX	RPHX	RPHX
	51 052 ...	51 051 ...	51 055 ...	51 108 ...	51 050 ...
ISO					
10T3M4SN		470 [1]	470 [1]		470 [1]
10T3M8SN		471	471		471
1204M4EN	475 [1]			475 [1]	
1204M4SN		475 [1]	475 [1]		475 [1]
1204M6SN		476			476
1204M8SN		477	476		477
1605M8SN		480			
2006M4SN		485 [1]			
2006M8SN			485		
P	●	●	●	●	●
M	●	●	●	●	●
K					
N					
S					
H					
O					

1) 4 köşeli takma uç

15

RPNX / RPHX

	-F50 CTCM245 DRAGONSKIN	-M50 CTCM245 DRAGONSKIN	-F50 CTCM245 DRAGONSKIN	-M50 CTCM245 DRAGONSKIN
				
	RPNX	RPNX	RPHX	RPHX
ISO	51 055 ...	51 054 ...	51 051 ...	51 050 ...
10T3M4SN	92001[1)]		92001[1)]	92001[1)]
10T3M8SN	92101		92101	
1204M4SN	92501[1)]		92501[1)]	92501[1)]
1204M6SN		92601	92601	92601
1204M8SN	92601			92701
1605M8SN	93001		93001	
2006M8SN	93501	93501		
P	●	●	●	●
M	●	●	●	●
K				
N				
S	○	○	○	○
H				
O				

1) 4 köşeli takma uç

RPHX / RPNX

		-SN CTCK215 DRAGONSKIN	-SN CTCK215 DRAGONSKIN	-SN CTPK220 DRAGONSKIN	NEW -F10 CTPX715 DRAGONSKIN	-27P H216T
						
		RPHX	RPNX	RPNX	RPHX	RPHX
ISO		51 052 ...	51 057 ...	51 057 ...	51 156 ...	50 483 ...
10T3M8FN					02002	600
10T3M8SN	520			620		
1204M8FN					02502	602
1204M8SN	525	525		625		
1605M8FN					03002	604
1605M8SN	530	530		630		
2006M8SN		535		635		
P					○	
M					○	
K	●	●	●		●	○
N					●	●
S					○	
H						
O					○	○

RPNX / RPHX

	-M31 CTC5240 DRAGONSKIN	-M31 CTC5240 DRAGONSKIN	-F50 CTCS245 DRAGONSKIN	-F50 CTCS245 DRAGONSKIN	-R60 CTP6215
					
	RPNX	RPHX	RPHX	RPNX	RPNX
ISO	51 149 ...	50 493 ...	51 051 ...	51 055 ...	50 508 ...
10T3M4EN		550 [1]			
10T3M4SN			570 [1]		
10T3M8EN		551			
10T3M8SN			571		
1204M4EN		552 [1]			
1204M4SN			575		
1204M6EN		56200			
1204M6SN			57800		
1204M8EN		582			300
1204M8SN			577		
1605M8EN		555	58100		
2006M8EN	12001				
2006M8SN				585	
P					
M					
K					●
N					
S	●	●	●	●	
H					●
O					

1) 4 köşeli takma uç

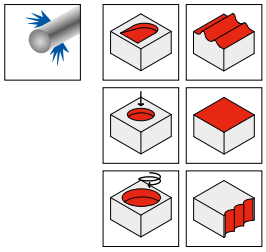
Frezeleme rehberi

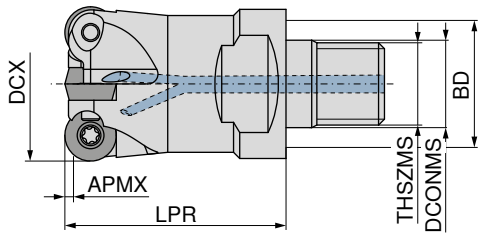
Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 181
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

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R 1000 yuvarlak uçlu, vidalı freze

▲ Uç eksenel açısı 0°







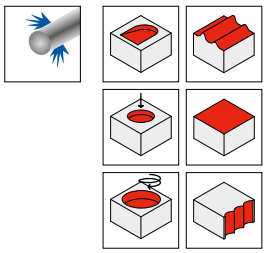
56 403 ...

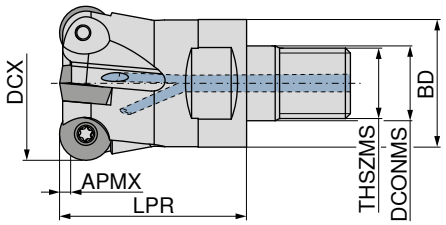
Tanımlama	DCX mm	ZNF	APMX mm	THSZMS	LPR mm	DCONMS mm	BD mm	Sıkma momenti Nm	Uç	
R1000G.15.2.M8-07.IK	15	2	1,5	M8	28,5	8,5	13,8	0,9	RD.X 0702..	**153**
R1000G.16.3.M8-07.IK	16	3	1,5	M8	28,5	8,5	13,8	0,9	RD.X 0702..	**161**
R1000G.20.4.M10-07.IK	20	4	1,5	M10	28,5	10,5	18,0	0,9	RD.X 0702..	**203**
R1000G.25.5.M12-07.IK	25	5	1,5	M12	28,5	12,5	21,0	0,9	RD.X 0702..	**252**
R1000G.30.5.M16-07.IK	30	5	1,5	M16	28,5	17,0	29,0	0,9	RD.X 0702..	**301**
R1000G.35.6.M16-07.IK	35	6	1,5	M16	28,5	17,0	29,0	0,9	RD.X 0702..	**351**
R1000G.42.7.M16-07.IK	42	7	1,5	M16	42,5	17,0	29,0	0,9	RD.X 0702..	**421**
R1000G.20.2.M10-10.IK	20	2	2,8	M10	29,0	10,5	18,0	2,4	RD.X 1003..	**204**
R1000G.25.2.M12-10.IK	25	2	2,8	M12	33,0	12,5	21,0	2,4	RD.X 1003..	**253**
R1000G.25.3.M12-10.IK	25	3	2,8	M12	33,0	12,5	21,0	2,4	RD.X 1003..	**254**
R1000G.30.4.M12-10.IK	30	4	2,3	M12	33,0	12,5	21,0	2,4	RD.X 1003..	**302**
R1000G.30.4.M16-10.IK	30	4	2,8	M16	43,0	17,0	23,0	2,4	RD.X 1003..	**303**
R1000G.35.5.M16-10.IK	35	5	2,8	M16	43,0	17,0	29,0	2,4	RD.X 1003..	**352**
R1000G.42.5.M16-10.IK	42	5	2,8	M16	43,0	17,0	29,0	2,4	RD.X 1003..	**422**
R1000G.42.6.M16-10.IK	42	6	2,8	M16	43,0	17,0	29,0	2,4	RD.X 1003..	**423**
R1000G.24.2.M12-12.IK	24	2	3,0	M12	33,0	12,5	21,0	2,4	RD.X 12T3..	**241**
R1000G.35.3.M16-12.IK	35	3	3,0	M16	43,0	17,0	29,0	2,4	RD.X 12T3..	**353**
R1000G.35.4.M16-12.IK	35	4	3,0	M16	43,0	17,0	29,0	2,4	RD.X 12T3..	**354**
R1000G.42.4.M16-12.IK	42	4	3,0	M16	43,0	17,0	29,0	2,4	RD.X 12T3..	**424**
R1000G.42.5.M16-12.IK	42	5	3,0	M16	43,0	17,0	29,0	2,4	RD.X 12T3..	**425**
R1000G.32.2.M16-16.IK	32	2	4,0	M16	43,5	17,0	29,0	4,3	RD.X 1604..	**321**
R1000G.35.3.M16-16.IK	35	3	4,0	M16	43,5	17,0	29,0	4,3	RD.X 1604..	**355**

	Tork çubuğu	 Tesbit vidası	 Baskı pabucu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**56 950 ...**	**56 950 ...**	**80 950 ...**	**70 950 ...**	**56 950 ...**	**80 950 ...**
Yedek parçalar							
Uç							
RD.X 0702..	**032**			**109**	**303**	**006**	**191**
RD.X 1003..	**036**			**113**	**303**	**010**	**192**
RD.X 12T3..	**036**	**022**		**113**	**303**	**010**	**192**
RD.X 1604..	**037**		**210**	**114**	**303**	**012**	**192**

R 1007 yuvarlak uçlu, vidalı freze

▲ Uç eksenel açısı 7°
▲ Çelik için > %10 Cr





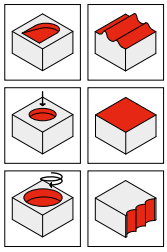


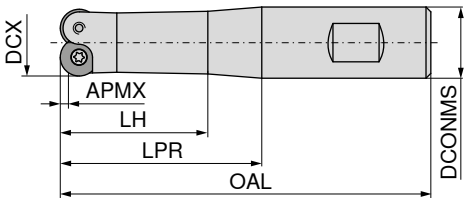
										56 405 ...
Tanımlama	DCX mm	ZNF	APMX mm	THSZMS	LPR mm	DCONMS mm	BD mm	Sıkma momenti Nm	Uç	
R1007G.25.3.M12-10.IK	25	3	2,5	M12	32,5	12,5	21	2,4	RD.X 1003..	**251**
R1007G.42.6.M16-10.IK	42	6	2,5	M16	42,5	17,0	29	2,4	RD.X 1003..	**421**
R1007G.35.4.M16-12.IK	35	4	3,0	M16	42,5	17,0	29	2,4	RD.X 12T3..	**352**

	Tork çubuğu	 Tesbit vidası	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**56 950 ...**	**80 950 ...**	**70 950 ...**	**56 950 ...**	**80 950 ...**
Yedek parçalar						
Uç						
RD.X 1003..	**036**		**113**	**303**	**010**	**192**
RD.X 12T3..	**036**	**022**	**113**	**303**	**010**	**192**

R 1002 yuvarlak uçlu parmak freze

▲ Uç eksenel açısı 0°







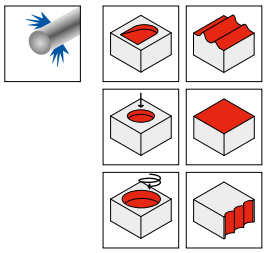


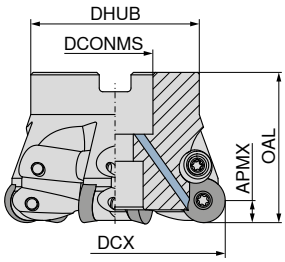
56 443 ...

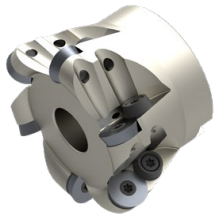
Tanımlama	DCX mm	ZNF	APMX mm	OAL mm	LPR mm	LH mm	DCONMS mm	Uç	
R1002C.15.2.40-07	15	2	2,6	89	40	23	16	RD.X 0702..	**151**
R1002C.15.2.60-07	15	2	2,6	109	60	23	16	RD.X 0702..	**152**
R1002C.15.2.80-07	15	2	2,6	131	80	22	20	RD.X 0702..	**153**
R1002C.15.2.100-07	15	2	2,6	151	100	22	20	RD.X 0702..	**154**
R1002C.20.2.40-10	20	2	4,0	91	40	23	20	RD.X 1003..	**201**
R1002C.20.2.60-10	20	2	4,0	111	60	23	20	RD.X 1003..	**202**
R1002C.20.2.80-10	20	2	4,0	137	80	23	25	RD.X 1003..	**203**
R1002C.20.2.100-10	20	2	4,0	157	100	23	25	RD.X 1003..	**204**
R1002C.20.2.120-10	20	2	4,0	177	125	23	25	RD.X 1003..	**205**

R 1000 yuvarlak uçlu, takma freze

▲ Uç eksenel açısı 0°







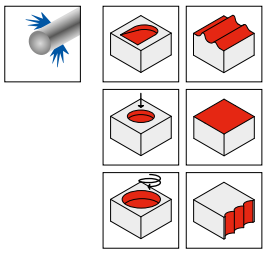
56 407 ...

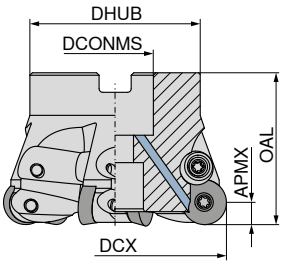
Tanımlama	DCX mm	ZNF	APMX mm	OAL mm	DCONMS mm	DHUB mm	Sıkma momenti Nm	Uç	
R1000A.42.6.43-10.IK	42	6	2,8	43,0	16	35	2,4	RD.X 1003..	**420**
R1000A.42.4.43-12.IK	42	4	3,0	43,0	16	35	2,4	RD.X 12T3..	**421**
R1000A.42.5.43-12.IK	42	5	3,0	43,0	16	35	2,4	RD.X 12T3..	**422**
R1000A.52.5.53-12.IK	52	5	3,5	53,0	22	40	2,4	RD.X 12T3..	**521**
R1000A.52.4.53,5-16.IK	52	4	4,7	53,5	22	40	4,3	RD.X 1604..	**522**
R1000A.66.5.53,5-16.IK	66	5	5,1	53,5	27	48	4,3	RD.X 1604..	**661**
R1000A.80.6.53,5-16.IK	80	6	5,8	53,5	27	60	4,3	RD.X 1604..	**801**

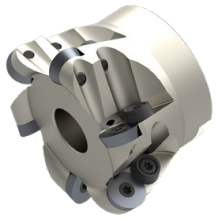
	Tork çubuğu	Tesbit vidası	Baskı pabucu	D-Anahtar	Vida Gresi	Sıkma vidası	Tork tornavidası.
	80 950 ...	**56 950 ...**	**56 950 ...**	**80 950 ...**	**70 950 ...**	**56 950 ...**	**80 950 ...**
Yedek parçalar							
Uç							
RD.X 1003..	**036**			**113**	**303**	**010**	**192**
RD.X 12T3..	**036**	**022**		**113**	**303**	**010**	**192**
RD.X 1604..	**037**		**210**	**114**	**303**	**012**	**192**

R 1007 yuvarlak uçlu, takma freze

▲ Uç eksenel açısı 7°
▲ Çelik için < %10 Cr + Düşük güçlü freze tezgahları için







56 409 ...

Tanımlama	DCX mm	ZNF	APMX mm	OAL mm	DCONMS mm	DHUB mm	Sıkma momenti Nm	Uç	
R1007A.42.6.42,5-10.IK	42	6	3,5	42,5	16	35	2,4	RD.X 1003..	**421**
R1007A.52.7.52,5-10.IK	52	7	3,5	52,5	22	40	2,4	RD.X 1003..	**521**
R1007A.52.5.52,5-12.IK	52	5	3,5	52,5	22	40	2,4	RD.X 12T3..	**522**
R1007A.66.6.52,5-12.IK	66	6	3,5	52,5	27	48	2,4	RD.X 12T3..	**661**
R1007A.80.7.54,5-12.IK	80	7	3,5	54,5	27	60	2,4	RD.X 12T3..	**801**
R1007A.52.5.53-16.IK	52	5	4,1	53,0	22	40	4,3	RD.X 1604..	**523**
R1007A.66.5.53-16.IK	66	5	4,6	53,0	27	48	4,3	RD.X 1604..	**662**
R1007A.66.6.53-16.IK	66	6	5,1	53,0	27	48	4,3	RD.X 1604..	**663**
R1007A.80.6.53-16.IK	80	6	5,1	53,0	27	60	4,3	RD.X 1604..	**802**
R1007A.100.7.53-16	100	7	5,1	53,0	32	70	4,3	RD.X 1604..	**910** 1)
R1007A.125.8.53-16	125	8	5,2	53,0	40	90	4,3	RD.X 1604..	**925** 1)
R1007A.160.9.53-16	160	9	5,1	53,0	40	120	4,3	RD.X 1604..	**960** 1)

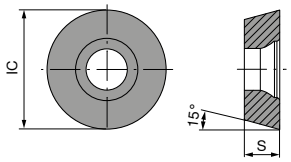
1) İçten soğutmasız.

	Tork çubuğu	 Tesbit vidası	 Baskı pabucu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**56 950 ...**	**56 950 ...**	**80 950 ...**	**70 950 ...**	**56 950 ...**	**80 950 ...**
Yedek parçalar							
Uç							
RD.X 1003..	**036**			**113**	**303**	**010**	**192**
RD.X 12T3..	**036**	**022**		**113**	**303**	**010**	**192**
RD.X 1604..	**037**		**210**	**114**	**303**	**012**	**192**

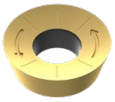
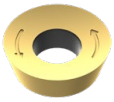
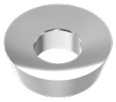
15

RDHX / RDMX / RDEX / RDPX

Tanımlama	IC mm	S mm
RD.X 0702..	7	2,38
RD.X 1003..	10	3,18
RD.X 12T3..	12	3,97
RD.X 1604..	16	4,76



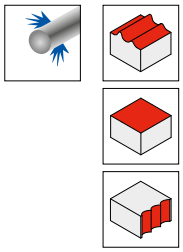
RDHX / RDMX / RDEX / RDPX

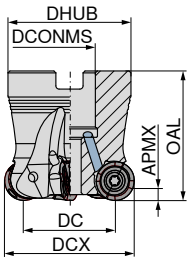
	WTN1205	WAN1240	WAX1240	-HP WAN2225	-F30P WUN4210
					
	RDHX	RDMX	RDEX	RDPX	RDHX
	56 302 ...	56 309 ...	56 314 ...	56 348 ...	56 304 ...
ISO					
0702M0E					611
0702M0T	111		611		
1003M0S				231	
1003M0T	131	731	631		631
12T3M0S				241	
12T3M0T	141	741	641		641
1604M0S				251	
1604M0T	151	751	651		651
P	●	●	●		
M	●	○	○	●	
K	●	○	○		○
N					●
S				●	
H	●				
O					○

Frezeleme rehberi

Kesme değerleri tablosu	→ 182–184	İşleme stratejisi	→ 185+186
Teknik Bilgiler	→ 193–198	Kaliteler Hakkında Açıklama	→ 199–201
Tanımlama sistemi	→ 202–208		

MaxiMill – 252 Yuvarlak uçlu freze







NEW

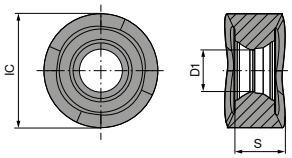
50 689 ...

Tanımlama	DC mm	DCX mm	ZNF	APMX mm	OAL mm	DCONMS mm	DHUB mm	Sıkma momenti Nm	Uç	
A252.40.R.05-10	30	40	5	2,5	40	16	38	2	RNHU 1004..	**140**
A252.42.R.05-10	32	42	5	2,5	40	16	38	2	RNHU 1004..	**142**
A252.50.R.06-10	40	50	6	2,5	40	22	43	2	RNHU 1004..	**150**
A252.52.R.07-10	42	52	7	2,5	40	22	43	2	RNHU 1004..	**152**
A252.63.R.08-10	53	63	8	2,5	40	22	48	2	RNHU 1004..	**16300**
A252.80.R.10-10	70	80	10	2,5	50	27	58	2	RNHU 1004..	**18000**
A252.40.R.04-12	28	40	4	3,0	40	16	38	3,2	RNHU 1205..	**240**
A252.50.R.05-12	38	50	5	3,0	40	22	43	3,2	RNHU 1205..	**250**
A252.52.R.05-12	40	52	5	3,0	40	22	43	3,2	RNHU 1205..	**252**
A252.63.R.06-12	51	63	6	3,0	40	22	48	3,2	RNHU 1205..	**263**
A252.66.R.07-12	54	66	7	3,0	40	22	48	3,2	RNHU 1205..	**266**
A252.80.R.08-12	68	80	8	3,0	50	27	58	3,2	RNHU 1205..	**280**
A252.100.R.10-12	88	100	10	3,0	50	32	78	3,2	RNHU 1205..	**30000**
A252.125.R.12-12	113	125	12	3,0	63	40	88	3,2	RNHU 1205..	**32500**

	Tork çubuğu	 T – anahtar	 D-Anahtar	 Tesbit vidası Power	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 397 ...**	**80 950 ...**	**70 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar							
Uç							
RNHU 1004.. (Ø40 – Ø80)	**053**		**127**		**303**	**710**	**192**
RNHU 1205.. (Ø40)	**054**	**040**	**128**	**151**	**303**	**839**	**192**
RNHU 1205.. (Ø50 – Ø125)	**054**		**128**		**303**	**839**	**192**

RNHU

Tanımlama	IC mm	D1 mm	S mm
RNHU 1004..	10	3,4	4,60
RNHU 1205..	12	4,4	5,30



RNHU

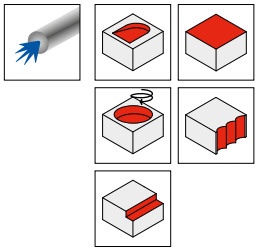
	NEW **-M50** CTPP235	NEW **-F50** CTPM240	NEW **-M31** CTPM245	NEW **-M32** CTPM245	NEW **-M31** CTC5240	NEW **-M31** CTC5240
	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN	DRAGONSKIN
						
	RNHU	RNHU	RNHU	RNHU	RNHU	RNHU
	51 130 ...	**51 129 ...**	**51 106 ...**	**51 107 ...**	**50 520 ...**	**50 521 ...**
ISO						
1004M4ER	**12000**	**42000**	**470**	**470**	**550**	
1205M4ER		**42500**	**475**	**475**		**552**
1205M4SR	**12500**					
P	●	○	●	●		
M	○	●	●	●		
K	○					
N						
S					●	●
H						
O						

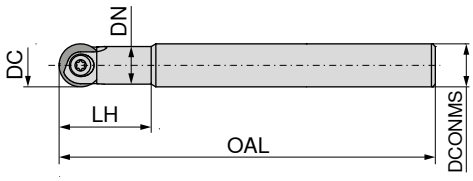
Frezeleme rehberi

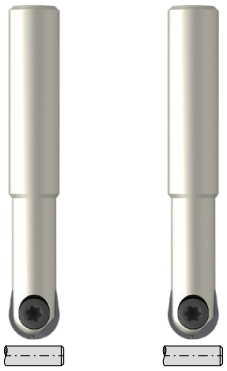
Kesme değerleri tablosu	→ 145–148	İşleme stratejisi	→ 187
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

K 2000 / K 2001 parmak kopya freze

▲ karbür saplı







ISO tanımlaması	DC mm	DN mm	LH mm	OAL mm	DCONMS mm	Sıkma momenti Nm	56 100 ...	56 101 ...
K2000C.6.16.100	6	5,3	16	100	8	0,5	060 [1]	
K2000C.6.20.100	6	5,8	20	100	6	0,5	061 [1]	
K2000C.6.70.150	6	5,8	70	150	6	0,5	062 [1]	
K2000C.6.100.200	6	5,8	100	200	6	0,5	063 [1]	
K2000C.8.25.80	8	7,0	25	80	8	1	081 [1]	
K2000C.8.25.100	8	7,0	25	100	8	1	082 [1]	
K2000C.8.40.150	8	7,0	40	150	8	1	083 [1]	
K2000C.10.35.80	10	8,8	35	80	10	3	101 [1]	
K2000C.10.35.120	10	8,8	35	120	10	3	102 [1]	
K2000C.10.50.150	10	8,8	50	150	10	3	103 [1]	
K2000C.12.35.80	12	10,5	35	80	12	4	121 [1]	
K2001C.12.35.80	12	10,5	35	80	12	4		121
K2000C.12.35.120	12	10,5	35	120	12	4	122 [1]	
K2001C.12.35.120	12	10,5	35	120	12	4		122
K2000C.12.50.160	12	10,5	50	160	12	4	123 [1]	
K2001C.12.50.160	12	10,5	50	160	12	4		123
K2001C.16.40.100	16	14,0	40	100	16	5		161
K2001C.16.40.140	16	14,0	40	140	16	5		162
K2001C.16.55.175	16	14,0	55	175	16	5		163
K2001C.20.50.100	20	18,0	50	100	20	5		201
K2001C.20.50.140	20	18,0	50	140	20	5		202
K2001C.20.75.190	20	18,0	75	190	20	5		203
K2001C.25.60.160	25	22,4	60	160	25	8		252
K2001C.25.90.210	25	22,4	90	210	25	8		253

1) İçten soğutmasız.

Kullanılabilir uç

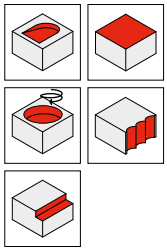
	ROHX-FM3, ROHX-FM4, ROHX-FM6, ROHX-MR5, ROGX-MR4

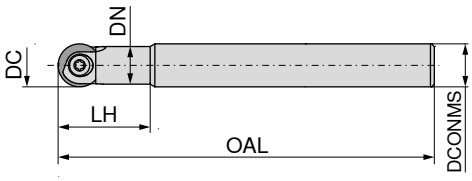
	XOHX06.. -MR2, XOHX-FM1

15

K 2002 parmak kopya freze

▲ silindirik çelik şaft tasarımlı







56 102 ...

Tanımlama	DC mm	DN mm	LH mm	OAL mm	DCONMS mm	Sıkma momenti Nm	
K2002C.12.32.90	12	10,5	32	90	12	4	**121**
K2002C.12.32.130	12	10,5	32	130	12	4	**122**
K2002C.12.46.150	12	10,5	46	150	12	4	**123**
K2002C.16.36.100	16	14,0	36	100	16	5	**161**
K2002C.16.36.140	16	14,0	36	140	16	5	**162**
K2002C.16.53.160	16	14,0	53	160	16	5	**163**
K2002C.20.45.160	20	18,0	45	160	20	5	**202**
K2002C.20.61.175	20	18,0	61	175	20	5	**203**
K2002C.25.45.160	25	22,4	45	160	25	8	**252**
K2002C.25.70.190	25	22,4	70	190	25	8	**253**
K2002C.32.56.175	32	28,6	56	175	32	8	**322**
K2002C.32.80.210	32	28,6	80	210	32	8	**323**

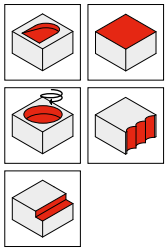
Kullanılabilr uç

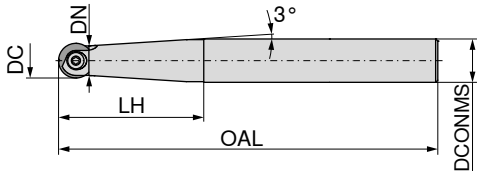
	**ROHX-FM3, ROHX-FM4, ROHX-FM6, ROHX-MR5, ROGX-MR4**

	**XOHX-FM1**

K 2003 parmak kopya freze

▲ Konik tip







56 104 ...

Tanımlama	DC mm	DN mm	LH mm	OAL mm	DCONMS mm	Sıkma momenti Nm	
K2003C.6.16.90	6	5,3	40	90	10	0,5	**061**
K2003C.8.50.85	8	7,5	50	85	12	1	**081**
K2003C.8.50.140	8	7,5	50	140	12	1	**082**
K2003C.10.35.85	10	9,0	35	85	12	3	**101**
K2003C.10.35.150	10	9,0	35	150	12	3	**102**
K2003C.12.60.110	12	10,5	60	110	16	4	**121**
K2003C.12.60.160	12	10,5	60	160	16	4	**122**
K2003C.16.67.120	16	14,0	67	120	20	5	**161**
K2003C.16.67.175	16	14,0	67	175	20	5	**162**
K2003C.20.80.190	20	18,0	80	190	25	5	**201**
K2003C.25.100.210	25	22,4	100	210	32	8	**251**
K2003C.32.123.240	32	28,6	123	240	40	8	**321**

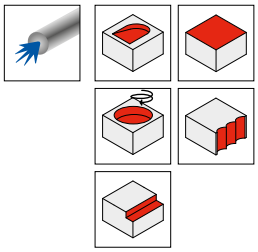
Kullanılabilir uç

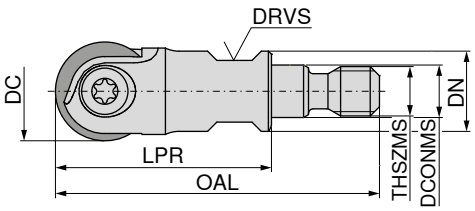
	**ROHX-FM3, ROHX-FM4, ROHX-FM6, ROHX-MR5, ROGX-MR4**

	**XOHX-FM1**

15

K 2000 vidalı kopya freze







56 120 ...

Tanımlama	DC mm	LPR mm	DN mm	OAL mm	DCONMS mm	THSZMS	DRVS mm	Sıkma momenti Nm	
K2000G.8.25.M6	8	25	10	39,5	6,5	M6	8	1	**081** [1]
K2000G.10.25.M6	10	25	10	39,5	6,5	M6	8	3	**101** [1]
K2000G.12.25.M6	12	25	10	39,5	6,5	M6	8	4	**121** [1]
K2000G.12.26.M8	12	26	13	43,5	8,5	M8	10	4	**122**
K2000G.16.26.M8	16	26	13	43,5	8,5	M8	10	5	**161**
K2000G.20.30.M10	20	30	18	49,5	10,5	M10	15	5	**201**
K2000G.25.40.M12	25	40	21	62,0	12,5	M12	17	8	**251**
K2000G.32.45.M16	32	45	30	69,0	17,0	M16	26	8	**321**

1) İçten soğutmasız.

Kullanılabilir uç

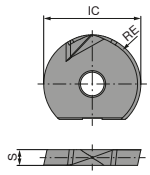
	**ROHX-FM3, ROHX-FM4, ROHX-FM6, ROHX-MR5, ROGX-MR4**

	**XOHX-FM1**

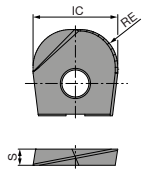
	Tork çubuğu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 950 ...**	**70 950 ...**	**56 950 ...**	**80 950 ...**
Yedek parçalar DC					
6	**031**	**108**	**303**	**041**	**191**
8	**033**	**110**	**303**	**042**	**191**
10	**036**	**113**	**303**	**043**	**193**
12	**037**	**114**	**303**	**044**	**193**
16	**037**	**114**	**303**	**045**	**193**
20	**037**	**114**	**303**	**046**	**193**
25		**131**	**303**	**047**	
32		**131**	**303**	**048**	

ROHX / XOHX / ROGX

Tanımlama	IC mm	S mm
ROHX0616R..	6	1,60
ROHX0820R..	8	2,00
ROHX1025R..	10	2,50
XOHX10254..	10	2,50
XOHX12255..	12	2,50
RO.X1225R..	12	2,50
RO.X1630R..	16	3,00
XOHX16307..	16	3,00
XOHX20309..	20	3,00
RO.X2030R..	20	3,00
RO.X2540R..	25	4,00
RO.X3250R..	32	5,00



RO.X



XOHX

ROHX / XOHX / ROGX

ISO	RE mm	-MR5 CTPP211	-FM1 CTPP216	-FM3 CTPP216	-FM4 CTPP216	-FM4 CTPK226	-MR4 CTPK231	-FM6 CTCN211
								
		ROHX	XOHX	ROHX	ROHX	ROHX	ROGX	ROHX
		56 149 ...	56 169 ...	56 147 ...	56 141 ...	56 141 ...	56 143 ...	56 145 ...
0616 R3	3,0			30200	90200			602 1)
0820 R4	4,0	71300		31300	71300	11300		613 1)
1025 R5	5,0	72400		32400	72400	12400		624 1)
102540	4,0		92400					
1225 R6	6,0			33500	73500	13500	53500	635 1)
122550	5,0		93500					
1630 R8	8,0			34600	74600	14600	54600	646 1)
163070	7,0		94700					
2030 R10	10,0			35700	75700	15700	55700	
203090	9,0		95900					
2540 R12,5	12,5			36800	76800	16800	56800	
3250 R16	16,0			37900	77900	17900	57900	
P		●	●	●	●	●	●	
M		○	○	○	○	●	●	
K		○	●	●	●	●	●	
N		○	○	○	○		○	○
S		○	○	○	○		○	
H		○	●	●	●	○	○	
O		○	○	○	○			●

1) Özellikle grafit işlemek için

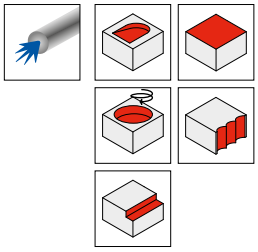
Frezeleme rehberi

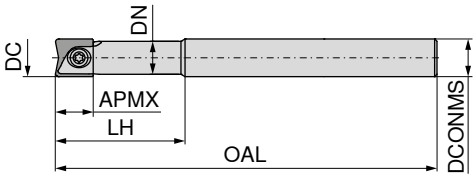
Kesme değerleri tablosu	→ 188+189	besleme	→ 190
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

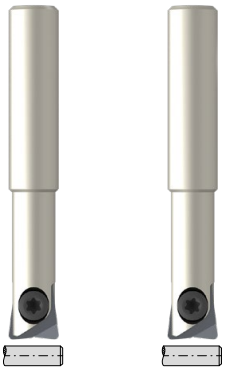
15

K 2005 / K 2006 parmak kopya freze

▲ karbür saplı







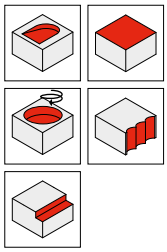
Tanımlama	DC mm	APMX mm	DN mm	LH mm	OAL mm	DCONMS mm	Sıkma momenti Nm	56 110 ...	56 111 ...
K2005C.8.27.82	8	9,5	7,0	27	82	8	1	**081** [1]	
K2005C.8.27.102	8	9,5	7,0	27	102	8	1	**082** [1]	
K2005C.8.42.152	8	9,5	7,0	42	152	8	1	**083** [1]	
K2005C.10.37.82	10	11,5	8,8	37	82	10	3	**101** [1]	
K2005C.10.37.122	10	11,5	8,8	37	122	10	3	**102** [1]	
K2005C.10.52.152	10	11,5	8,8	52	152	10	3	**103** [1]	
K2005C/K2006C.12.37.82	12	14,0	10,5	37	82	12	4	**121** [1]	**121**
K2005C/K2006C.12.37.122	12	14,0	10,5	37	122	12	4	**122** [1]	**122**
K2005C/K2006C.12.52.162	12	14,0	10,5	52	162	12	4	**123** [1]	**123**
K2006C.16.42.102	16	16,0	14,0	42	102	16	5		**161**
K2006C.16.42.142	16	16,0	14,0	42	142	16	5		**162**
K2006C.16.57.177	16	16,0	14,0	57	177	16	5		**163**
K2006C.20.52.102	20	18,0	18,0	52	102	20	5		**201**
K2006C.20.52.142	20	18,0	18,0	52	142	20	5		**202**
K2006C.20.77.192	20	18,0	18,0	77	192	20	5		**203**
K2006C.25.62.162	25	23,5	22,4	62	162	25	8		**252**
K2006C.25.92.212	25	23,5	22,4	92	212	25	8		**253**

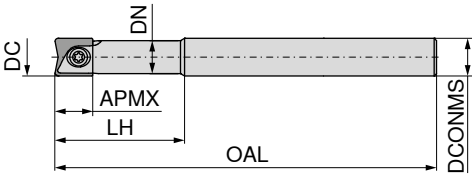
1) İçten soğutmasız.

Kullanılabilir uç

	**XOHX-FM2 / -FM5 / -MR2 / -MR3 / -MR6**
	XOGX-MF4

K 2007 parmak kopya freze







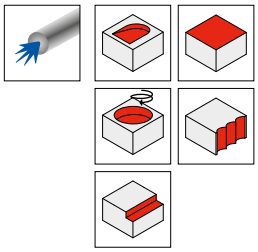
56 112 ...

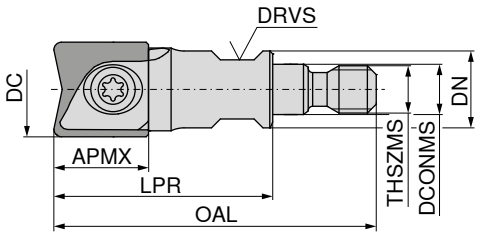
Tanımlama	DC	APMX	DN	LH	OAL	DCONMS	Sıkma momenti	
	mm	mm	mm	mm	mm	mm	Nm	
K2007C.12.34.132	12	14,0	10,5	34	132	12	4	**122**
K2007C.12.34.92	12	14,0	10,5	34	92	12	4	**121**
K2007C.12.48.152	12	14,0	10,5	48	152	12	4	**123**
K2007C.16.38.102	16	16,0	14,0	38	102	16	5	**161**
K2007C.16.38.142	16	16,0	14,0	38	142	16	5	**162**
K2007C.16.55.162	16	16,0	14,0	55	162	16	5	**163**
K2007C.20.47.162	20	18,0	18,0	47	162	20	5	**202**
K2007C.20.63.177	20	18,0	18,0	63	177	20	5	**203**
K2007C.25.47.162	25	23,5	22,4	47	162	25	8	**252**
K2007C.25.72.192	25	23,5	22,4	72	192	25	8	**253**
K2007C.32.58.177	32	28,0	28,6	58	177	32	8	**322**
K2007C.32.82.212	32	28,0	28,6	82	212	32	8	**323**

Kullanılabilir uç

	**XOHX-FM2 / -FM5 / -MR2 / -MR3 / -MR6**
	XOGX-MF4

K 2005 vidalı kopya freze







56 130 ...

Tanımlama	DC mm	APMX mm	DN mm	LPR mm	OAL mm	DCONMS mm	THSZMS	DRVS mm	Sıkma momenti Nm	
K2005G.8.25.M6	8	9,5	10	25	39,5	6,5	M6	8	1	**081** [1]
K2005G.10.25.M6	10	11,5	10	25	39,5	6,5	M6	8	3	**101** [1]
K2005G.12.25.M6	12	14,0	10	25	39,5	6,5	M6	8	4	**121** [1]
K2005G.12.28.M8	12	14,0	13	28	45,5	8,5	M8	8	4	**122**
K2005G.16.28.M8	16	16,0	13	28	45,5	8,5	M8	10	5	**161**
K2005G.20.32.M10	20	18,0	18	32	51,5	10,5	M10	15	5	**201**
K2005G.25.42.M12	25	23,5	21	42	64,0	12,5	M12	17	8	**251**
K2005G.32.47.M16	32	28,0	30	47	71,0	17,0	M16	26	8	**321**

1) İçten soğutmasız.

Kullanılabilir uç



XOHX-FM2 / -FM5 / -MR2 / -MR3 / -MR6
XOGX-MF4

Tork çubuğu

80 950 ...



D-Anahtar

80 950 ...



Vida Gresi

70 950 ...



Sıkma vidası

56 950 ...



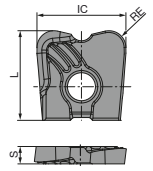
Tork tornavidası.

80 950 ...

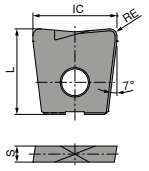
Yedek parçalar DC									
8	**033**		**110**		**303**		**042**		**191**
10	**036**		**113**		**303**		**043**		**193**
12	**037**		**114**		**303**		**044**		**193**
16	**037**		**114**		**303**		**045**		**193**
20	**037**		**114**		**303**		**046**		**193**
25			**131**		**303**		**047**		
32			**131**		**303**		**048**		

XOHX / XOGX

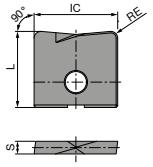
Tanımlama	IC	S	L
	mm	mm	mm
XO.X10251..	10	2,50	11,5
XO.X12251..	12	2,50	14,0
XO.X16301..	16	3,00	16,0
XO.X16303..	16	3,00	16,0
XO.X20301..	20	3,00	18,0
XO.X20304..	20	3,00	18,0
XOGX12252..	12	2,50	14,0
XOHX06160..	6	1,60	8,0
XOHX08200..	8	2,00	9,5
XOHX08201..	8	2,00	9,5
XOHX10250..	10	2,50	11,5
XOHX12252..	12	3,00	14,0
XOHX20302..	20	3,00	18,0
XOHX25401..	25	4,00	23,5
XOHX25402..	25	4,00	23,5
XOHX25405..	25	4,00	23,5
XOHX32502..	32	5,00	28,0



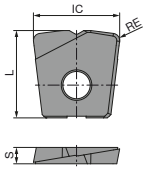
XOGX



XOHX

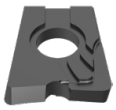
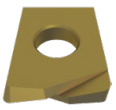
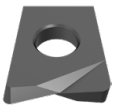


XOHX



XOHX

XOHX / XOGX

	-MR2 CTPP211	-MR6 CTPP211	-FM2 CTPP216	-FM5 CTPP216	-MF4 CTPP216	-MR3 CTPK231	-MR2 CTCN211
							
	XOHX	XOHX	XOHX	XOHX	XOGX	XOHX	XOHX
	56 167 ...	56 163 ...	56 165 ...	56 159 ...	56 161 ...	56 171 ...	56 168 ...
ISO / RE mm							
061605 0,5	71000						610 1)
082006 0,6		71000	71000	71000			
082010 1,0	71200		71200				612 1)
102508 0,8		72100	72100	72100		32100	
102510 1,0	72200		72200		92200		622 1)
122510 1,0	73200	73200	73200	73200	93200	53200	632 1)
122520 2,0	73500		73500		93500		
163010 1,0	74200		74200		94200		642 1)
163013 1,3		74300	74300	74300			
163015 1,5						54400	
163030 3,0	74700		74500		94700		
203010 1,0	75200		75200		95200		
203016 1,6		75400	75400	75400			
203020 2,0						55500	
203040 4,0	75800		75800		95800		
254010 1,0	76200		76200				
254020 2,0		76500	76500	76500			
254050 5,0	76900		76900				
325025 2,5		77600		77600			
P	●	●	●	●	●	●	
M	○	○	○	○	○	●	
K	○	○	●	●	●	●	
N	○	○	○	○	○	○	○
S	○	○	○	○	○	○	
H	○	○	●	●	●	○	
O	○	○	○	○	○		●

1) Özellikle grafit işlemek için

Frezeleme rehberi

Kesme değerleri tablosu	→ 188+189	besleme	→ 190
Teknik Bilgiler	→ 193–198	Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201
Tür tanımı ve genel bakış	→ 202–208		

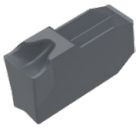
15

Uygulama notları – **MaxiMill** – Slot-SX

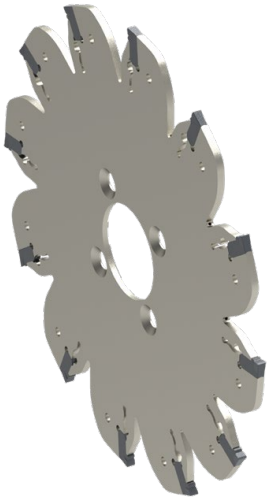
▲ Takımla çalışmak için aşağıdaki bileşenlerde ihtiyaç vardır:



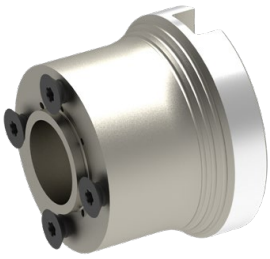
Montaj anahtarı



Kesme uç



Ayırıcı disk freze

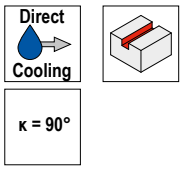


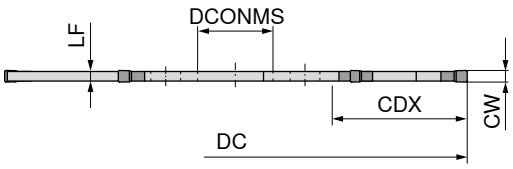
Ayırıcı freze tutucusu

MaxiMill – Slot-SX disk ayırma frezesi

Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**







NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 383 ...
ASLOT.80.R.6.13.DC-SX2	80	2	23	13	1,65	6	SX E2 ..	AD.SLOT.13...	**08002**
ASLOT.80.R.6.13.DC-SX3	80	3	23	13	2,50	6	SX E3 ..	AD.SLOT.13...	**08003**
ASLOT.80.R.4.13.DC-SX4	80	4	23	13	3,50	4	SX E4 ..	AD.SLOT.13...	**08004**
ASLOT.80.R.4.13.DC-SX5	80	5	23	13	4,50	4	SX E5 ..	AD.SLOT.13...	**08005**



sıkma vidası



Ejektör-SX

Yedek parçalar için Ürün kodu	50 950 ...	70 950 ...
50 383 08002	**00100**	**836**
50 383 08003	**00100**	**836**
50 383 08004	**00100**	**837**
50 383 08005	**00100**	**837**

Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

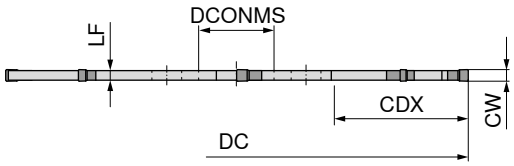
MaxiMill – Slot-SX disk ayırma frezesi

Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**

Direct Cooling

κ = 90°





NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS H6 mm	LF mm	ZEFP	Uç	Tutucu	50 384 ...
ASLOT.100.R.8.22.DC-SX2	100	2	29	22	1,65	8	SX E2 ..	AD.SLOT.22...	**10002**
ASLOT.100.R.8.22.DC-SX3	100	3	29	22	2,50	8	SX E3 ..	AD.SLOT.22...	**10003**
ASLOT.100.R.6.22.DC-SX4	100	4	29	22	3,50	6	SX E4 ..	AD.SLOT.22...	**10004**
ASLOT.100.R.6.22.DC-SX5	100	5	29	22	4,50	6	SX E5 ..	AD.SLOT.22...	**10005**
ASLOT.100.R.4.22.DC-SX6	100	6	29	22	5,40	4	SX E6 ..	AD.SLOT.22...	**10006**



sıkma vidası

50 950 ...



Ejektör-SX

70 950 ...

Yedek parçalar için Ürün kodu		
50 384 10002	**00100**	**836**
50 384 10003	**00100**	**836**
50 384 10004	**00100**	**837**
50 384 10005	**00100**	**837**
50 384 10006	**00100**	**837**

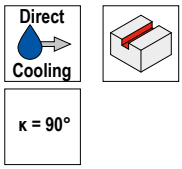
Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

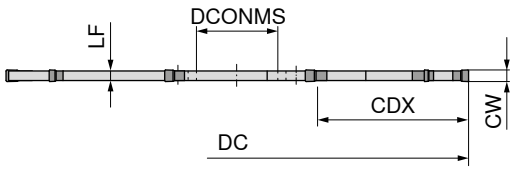
15

MaxiMill – Slot-SX disk ayırma frezesi

Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**







NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 385 ...
ASLOT.125.R.10.22.DC-SX2	125	2	42	22	1,65	10	SX E2 ..	AD.SLOT.22...	**12502**
ASLOT.125.R.10.22.DC-SX3	125	3	42	22	2,50	10	SX E3 ..	AD.SLOT.22...	**12503**



sıkma vidası



Ejektör-SX

Yedek parçalar için Ürün kodu	50 950 ...	70 950 ...
50 385 12502	**00100**	**836**
50 385 12503	**00100**	**836**

Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

MaxiMill – Slot-SX disk ayırma frezesi

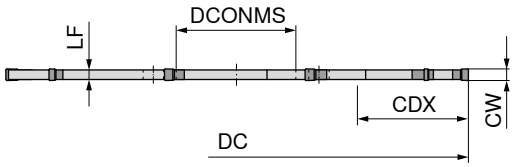
Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**











NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 386 ...
ASLOT.125.R.10.32.DC-SX2	125	2	30	32	1,65	10	SX E2 ..	AD.SLOT.32...	**12502**
ASLOT.125.R.10.32.DC-SX3	125	3	30	32	2,50	10	SX E3 ..	AD.SLOT.32...	**12503**
ASLOT.125.R.8.32.DC-SX4	125	4	30	32	3,50	8	SX E4 ..	AD.SLOT.32...	**12504**
ASLOT.125.R.8.32.DC-SX5	125	5	30	32	4,50	8	SX E5 ..	AD.SLOT.32...	**12505**
ASLOT.125.R.8.32.DC-SX6	125	6	30	32	5,40	8	SX E6 ..	AD.SLOT.32...	**12506**



sıkma vidası



Ejektör-SX

Yedek parçalar için Ürün kodu	50 950 ...	70 950 ...
50 386 12502	**00200**	**836**
50 386 12503	**00200**	**836**
50 386 12504	**00200**	**837**
50 386 12505	**00200**	**837**
50 386 12506	**00200**	**837**

Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

MaxiMill – Slot-SX disk ayırma frezesi

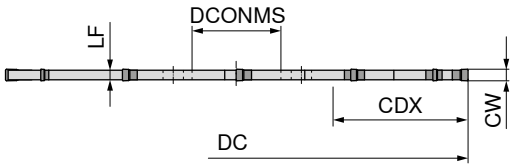
Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**











NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 387 ...
ASLOT.160.R.12.32.DC-SX2	160	2	48	32	1,65	12	SX E2 ..	AD.SLOT.32...	**16002**
ASLOT.160.R.12.32.DC-SX3	160	3	48	32	2,50	12	SX E3 ..	AD.SLOT.32...	**16003**



sıkma vidası

50 950 ...



Ejektör-SX

70 950 ...

Yedek parçalar için Ürün kodu		
50 387 16002	**00200**	**836**
50 387 16003	**00200**	**836**

Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

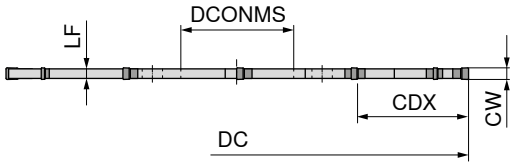
MaxiMill – Slot-SX disk ayırma frezesi

Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**

Direct Cooling

κ = 90°





NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 388 ...
ASLOT.160.R.12.40.DC-SX2	160	2	39	40	1,65	12	SX E2 ..	AD.SLOT.40...SK	**16002**
ASLOT.160.R.12.40.DC-SX3	160	3	39	40	2,50	12	SX E3 ..	AD.SLOT.40...SK	**16003**
ASLOT.160.R.10.40.DC-SX4	160	4	39	40	3,50	10	SX E4 ..	AD.SLOT.40...SK	**16004**
ASLOT.160.R.10.40.DC-SX5	160	5	39	40	4,50	10	SX E5 ..	AD.SLOT.40...SK	**16005**
ASLOT.160.R.10.40.DC-SX6	160	6	39	40	5,40	10	SX E6 ..	AD.SLOT.40...SK	**16006**



sıkma vidası



Ejektör-SX

Yedek parçalar için Ürün kodu	50 950 ...	70 950 ...
50 388 16002	**00300**	**836**
50 388 16003	**00300**	**836**
50 388 16004	**00300**	**837**
50 388 16005	**00300**	**837**
50 388 16006	**00300**	**837**

Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

MaxiMill – Slot-SX disk ayırma frezesi

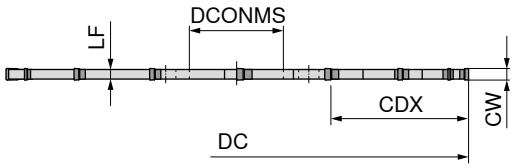
Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**











NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 389 ...
ASLOT.200.R.16.40.DC-SX2	200	2	59	40	1,65	16	SX E2 ..	AD.SLOT.40...SK	**20002**
ASLOT.200.R.16.40.DC-SX3	200	3	59	40	2,50	16	SX E3 ..	AD.SLOT.40...SK	**20003**
ASLOT.200.R.14.40.DC-SX4	200	4	59	40	3,50	14	SX E4 ..	AD.SLOT.40...SK	**20004**
ASLOT.200.R.14.40.DC-SX5	200	5	59	40	4,50	14	SX E5 ..	AD.SLOT.40...SK	**20005**
ASLOT.200.R.14.40.DC-SX6	200	6	59	40	5,40	14	SX E6 ..	AD.SLOT.40...SK	**20006**



sıkma vidası



Ejektör-SX

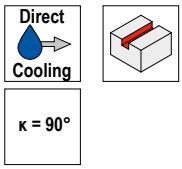
Yedek parçalar için Ürün kodu	50 950 ...	70 950 ...
50 389 20002	**00300**	**836**
50 389 20003	**00300**	**836**
50 389 20004	**00300**	**837**
50 389 20005	**00300**	**837**
50 389 20006	**00300**	**837**

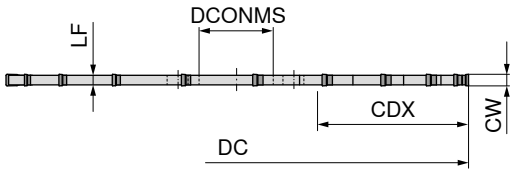
Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

MaxiMill – Slot-SX disk ayırma frezesi

Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**







NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 380 ...
ASLOT.250.R.20.40.DC-SX3	250	3	84	40	2,5	20	SX E3 ..	AD.SLOT.40...ZK	**25003**
ASLOT.250.R.18.40.DC-SX4	250	4	84	40	3,5	18	SX E4 ..	AD.SLOT.40...ZK	**25004**
ASLOT.250.R.18.40.DC-SX5	250	5	84	40	4,5	18	SX E5 ..	AD.SLOT.40...ZK	**25005**
ASLOT.250.R.18.40.DC-SX6	250	6	84	40	5,4	18	SX E6 ..	AD.SLOT.40...ZK	**25006**[1)]

1) Stoksuz



sıkma vidası



Ejektör-SX

Yedek parçalar için Ürün kodu	50 950 ...	70 950 ...
50 380 25003	**00400**	**836**
50 380 25004	**00400**	**837**
50 380 25005	**00400**	**837**
50 380 25006	**00400**	**837**

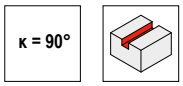
Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

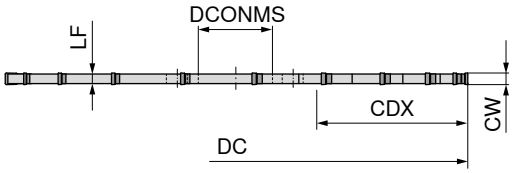
15

MaxiMill – Slot-SX disk ayırma frezesi

Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**







NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 390 ...
ASLOT.250.R.20.40-SX3	250	3	84	40	2,5	20	SX E3 ..	AD.SLOT.40...ZK	**25003**
ASLOT.250.R.18.40-SX4	250	4	84	40	3,5	18	SX E4 ..	AD.SLOT.40...ZK	**25004**
ASLOT.250.R.18.40-SX5	250	5	84	40	4,5	18	SX E5 ..	AD.SLOT.40...ZK	**25005**
ASLOT.250.R.18.40-SX6	250	6	84	40	5,4	18	SX E6 ..	AD.SLOT.40...ZK	**25006**[1)]

1) Stoksuz



sıkma vidası



Ejektör-SX

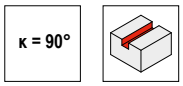
Yedek parçalar için Ürün kodu	50 950 ...	70 950 ...
50 390 25003	**00400**	**836**
50 390 25004	**00400**	**837**
50 390 25005	**00400**	**837**
50 390 25006	**00400**	**837**

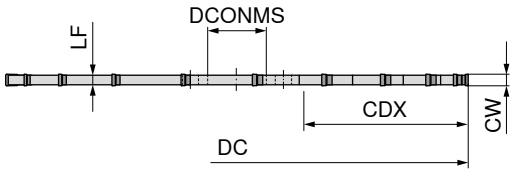
Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

MaxiMill – Slot-SX disk ayırma frezesi

Teslimat kapsamı:

Disk freze, montaj anahtarı **olmadan**, sıkıştırma vidası **olmadan**







NEW

Tanımlama	DC mm	CW mm	CDX mm	DCONMS $_{H6}$ mm	LF mm	ZEFP	Uç	Tutucu	50 391 ...
ASLOT.315.R.22.40-SX4	315	4	115	40	3,5	22	SX E4 ..	AD.SLOT.40...ZK	**31504**
ASLOT.315.R.22.40-SX5	315	5	115	40	4,5	22	SX E5 ..	AD.SLOT.40...ZK	**31505**
ASLOT.315.R.22.40-SX6	315	6	115	40	5,4	22	SX E6 ..	AD.SLOT.40...ZK	**31506**[1)]

1) Stoksuz



sıkma vidası

50 950 ...

Ejektör-SX

70 950 ...

Yedek parçalar için Ürün kodu		
50 391 31504	**00400**	**837**
50 391 31505	**00400**	**837**
50 391 31506	**00400**	**837**

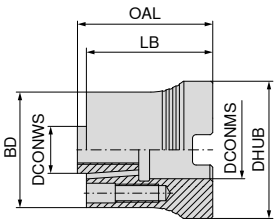
Uygun ayırıcı freze tutucusu için bkz. → **Sayfa 136**

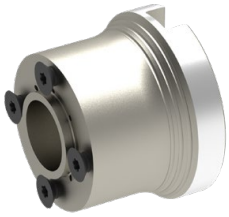
MaxiMill – Slot-SX ayırıcı freze tutucusu

Teslimat kapsamı:

Ayırıcı freze tutucusu, vidalar ile birlikte







NEW

Tanımlama	DCONMS mm	DCONWS h6 mm	DHUB mm	LB mm	OAL mm	BD mm	50 395 ...
AD.SLOT.13.32.A16	16	13	38	35	37,5	32	**01300**
AD.SLOT.22.40.A22	22	22	48	35	37,5	40	**02200**
AD.SLOT.22.40.A22.40	22	22	40	35	37,5	40	**02300**
AD.SLOT.32.63.A27	27	32	58	45	47,5	63	**03200**
AD.SLOT.40.80.A32.SK	32	40	78	55	57,5	80	**04000**
AD.SLOT.40.80.A32.ZK	32	40	78	55	57,5	80	**04100**

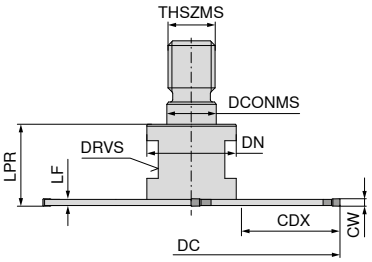
Yedek parçalar için Ürün kodu	 sıkma vidası 50 950 ...	 sıkma vidası 50 950 ...	 sıkma vidası 50 950 ...	 Tesbit vidası Power 70 950 ...
50 395 01300	**00100**			**151**
50 395 02200	**00100**			
50 395 03200	**00200**			
50 395 04000			**00300**	
50 395 04100		**00400**		

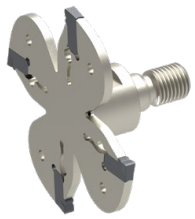
MaxiMill – Slot-SX vidalı ayırıcı freze

Teslimat kapsamı:
Disk freze Gövdesi, Uç **Montaj anahtarı** dahil değildir

Direct Cooling

κ = 90°





NEW

50 392 ...

Tanımlama	DC mm	CW mm	CDX mm	DCONMS mm	THSZMS	LF mm	DN mm	LPR mm	DRVS mm	ZEFP	Uç	
GSLOT.63.R.4.M10.DC-SX2	63	2	21	10,5	M10	1,65	19	18	15	4	SX E2 ..	**06302**
GSLOT.63.R.4.M10.DC-SX3	63	3	21	10,5	M10	2,50	19	18	15	4	SX E3 ..	**06303**



Ejektör-SX

70 950 ...

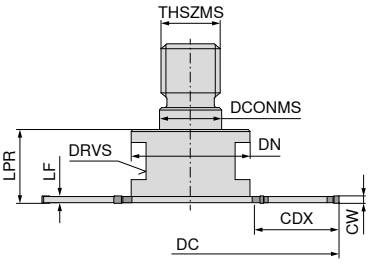
Yedek parçalar için Ürün kodu	
50 392 06302	**836**
50 392 06303	**836**

MaxiMill – Slot-SX vidalı ayırıcı freze

Teslimat kapsamı:
Disk freze Gövdesi, Uç **Montaj anahtarı** dahil değildir

Direct Cooling

κ = 90°





NEW

50 393 ...

Tanımlama	DC mm	CW mm	CDX mm	DCONMS mm	THSZMS	LF mm	DN mm	LPR mm	DRVS mm	ZEFP	Uç	
GSLOT.80.R.6.M16.DC-SX2	80	2	23	17	M16	1,65	32	20	24	6	SX E2 ..	**08002**
GSLOT.80.R.6.M16.DC-SX3	80	3	23	17	M16	2,50	32	20	24	6	SX E3 ..	**08003**
GSLOT.80.R.4.M16.DC-SX4	80	4	23	17	M16	3,50	32	20	24	4	SX E4 ..	**08004**



Ejektör-SX

70 950 ...

Yedek parçalar için Ürün kodu	
50 393 08002	**836**
50 393 08003	**836**
50 393 08004	**837**

15

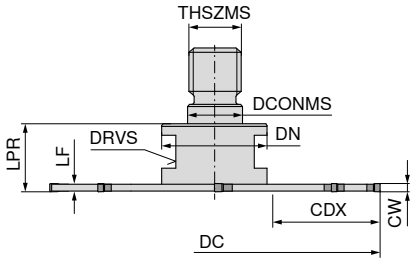
MaxiMill – Slot-SX vidalı ayırıcı freze

Teslimat kapsamı:

Disk freze Gövdesi, Uç **Montaj anahtarı** dahil değildir

Direct Cooling

κ = 90°





NEW

50 394 ...

Tanımlama	DC mm	CW mm	CDX mm	DCONMS mm	THSZMS	LF mm	DN mm	LPR mm	DRVS mm	ZEFP	Uç	
GSLOT.100.R.8.M16.DC-SX2	100	2	33	17	M16	1,65	32	20	24	8	SX E2 ..	**10002**
GSLOT.100.R.8.M16.DC-SX3	100	3	33	17	M16	2,50	32	20	24	8	SX E3 ..	**10003**
GSLOT.100.R.6.M16.DC-SX4	100	4	33	17	M16	3,50	32	20	24	6	SX E4 ..	**10004**



Ejektör-SX

70 950 ...

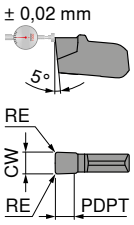
Yedek parçalar için Ürün kodu	
50 394 10002	**836**
50 394 10003	**836**
50 394 10004	**837**

Vidalı frezeler için uygun takım tutucuları Sıkma Teknolojileri Kataloğu – Bölüm 16 Takım Tutucular ve Aksesuarlar'da bulabilirsiniz

Kesici uç SX



F	M	R



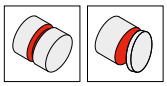
-F2
CTP1340
DRAGONSKIN



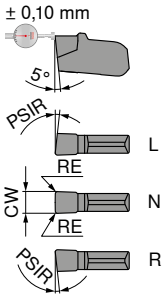
Tanımlama	CW mm	RE mm	PDPT mm	tutucu için	70 346 ...
SX E2.00 N 0.20	2	0,2	1,5	-SX2	**622**
SX E3.00 N 0.30	3	0,3	2,0	-SX3	**623**
SX E4.00 N 0.40	4	0,4	2,5	-SX4	**624**

P	●
M	●
K	○
N	○
S	●
H	
O	

Kesici uç SX

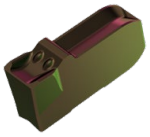


F	M	R



-M1
CTCP335
DRAGONSKIN

-M1
CTP1340
DRAGONSKIN





Tanımlama	IH	CW mm	RE mm	tutucu için	70 342 ...	70 342 ...
SX E2.00 N 0.20	N	2	0,2	-SX2	**52200**	**622**
SX E3.00 N 0.20	N	3	0,2	-SX3	**523**	**623**
SX E4.00 N 0.30	N	4	0,3	-SX4	**524**	**624**
SX E5.00 N 0.30	N	5	0,3	-SX5	**52500**	**625**
SX E6.00 N 0.40	N	6	0,4	-SX6	**52600**	**626**

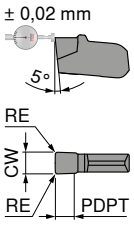
P	●	●
M	○	●
K	●	○
N		○
S		●
H		
O		

15

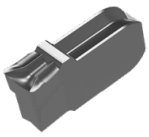
Kesici uç SX



F	M	R
	●	



-27P
H216T

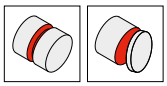


70 349 ...

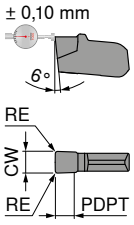
Tanımlama	CW mm	RE mm	PDPT mm	tutucu için	
SX E2.00 N 0.20	2	0,2	2,0	-SX2	**122**
SX E3.00 N 0.30	3	0,3	2,5	-SX3	**123**
SX E4.00 N 0.40	4	0,4	3,0	-SX4	**124**

P	
M	
K	○
N	●
S	
H	
O	○

Kesici uç SX



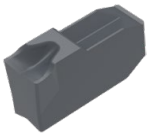
F	M	R
	●	



NEW

-M7
CTP1340

DRAGONSKIN

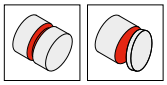


70 347 ...

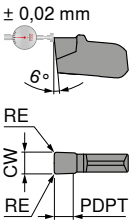
Tanımlama	CW mm	RE mm	PDPT mm	tutucu için	
SX E2.00 N 0.20	2	0,2	1,5	-SX2	**62200**
SX E3.00 N 0.20	3	0,2	2,0	-SX3	**62300**
SX E4.00 N 0.30	4	0,3	2,5	-SX4	**62400**
SX E5.00 N 0.30	5	0,3	2,7	-SX5	**62500**
SX E6.00 N 0.40	6	0,4	3,0	-SX6	**62600**

P	●
M	●
K	○
N	○
S	●
H	
O	

Kesici uç SX



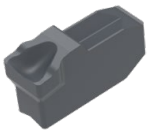
F	M	R



NEW

-M8
CTP1340

DRAGONSKIN



70 348 ...

Tanımlama	CW mm	RE mm	PDPT mm	tutucu için	
SX E2.00 N 0.20	2	0,2	1,5	-SX2	**62200**
SX E3.00 N 0.20	3	0,2	2,0	-SX3	**62300**
SX E4.00 N 0.30	4	0,3	2,5	-SX4	**62400**
SX E5.00 N 0.30	5	0,3	2,7	-SX5	**62500**
SX E6.00 N 0.40	6	0,4	3,0	-SX6	**62600**

P	●
M	●
K	○
N	○
S	●
H	
O	

Frezeleme rehberi

Kesme değerleri tablosu	→ 191	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

15

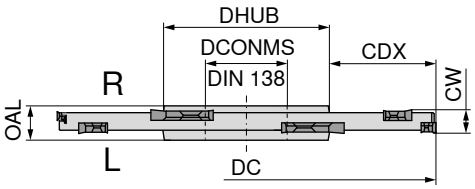
TX ayırıcı disk freze

▲ Dikkat: TX kanal freze çapraz dişli olup hem sağ hem de sol uçlarla birlikte kullanılmaktadır.
▲ ZEFP = Uç sayısı

Teslimat kapsamı:

Kanal freze, 2 yedek sıkıştırma vidası ve 1 tork-anahtar







50 730 ...

Tanımlama	DC mm	CW mm	ZNF	CDX mm	DCONMS mm	DHUB mm	OAL mm	ZEFP	Uç	Sıkma momenti Nm	
TX.STF.80X27.03.Z4	80	3	4	18,0	27	40	8	8	TX. 161702	0,7	**083**
TX.STF.100X32.03.Z5	100	3	5	25,0	32	46	8	10	TX. 161702	0,7	**103**
TX.STF.125X40.03.Z6	125	3	6	32,0	40	54	10	12	TX. 161702	0,7	**123**
TX.STF.160X40.03.Z8	160	3	8	50,0	40	54	10	16	TX. 161702	0,7	**163** 1)
TX.STF.80X27.04.Z4	80	4	4	18,0	27	40	8	8	TX. 162302	1,3	**084**
TX.STF.100X32.04.Z5	100	4	5	25,0	32	46	8	10	TX. 162302	1,3	**104**
TX.STF.125X40.04.Z6	125	4	6	32,0	40	54	10	12	TX. 162302	1,3	**124**
TX.STF.160X40.04.Z8	160	4	8	50,0	40	54	10	16	TX. 162302	1,3	**164** 1)
TX.STF.80X27.06.Z4	80	6	4	21,0	27	36	10	8	TX. 223202	2	**086**
TX.STF.80X22.06.Z4	80	6	4	22,0	22	33	10	8	TX. 223202	2	**080**
TX.STF.100X32.06.Z5	100	6	5	25,5	32	47	10	10	TX. 223202	2	**106**
TX.STF.125X40.06.Z6	125	6	6	32,5	40	58	10	12	TX. 223202	2	**136**
TX.STF.160X40.06.Z8	160	6	8	50,0	40	58	10	16	TX. 223202	2	**166** 1)
TX.STF.80X27.08.Z4	80	8	4	21,0	27	36	12	8	TX. 224302	2,8	**088**
TX.STF.100X32.08.Z5	100	8	5	25,5	32	47	12	10	TX. 224302	2,8	**108**
TX.STF.125X40.08.Z6	125	8	6	32,5	40	58	12	12	TX. 224302	2,8	**138**
TX.STF.160X40.08.Z8	160	8	8	50,0	40	58	12	16	TX. 224302	2,8	**168** 1)
TX.STF.80X27.10.Z4	80	10	4	21,0	27	36	12	8	TX. 225402	3	**090**
TX.STF.100X32.10.Z5	100	10	5	25,5	32	47	12	10	TX. 225402	3	**110**
TX.STF.125X40.10.Z6	125	10	6	32,5	40	58	14	12	TX. 225402	3	**140**
TX.STF.160X40.10.Z8	160	10	8	50,0	40	58	14	16	TX. 225402	3	**170** 1)

1) İçten soğutmasız.

	Tork çubuğu	 D-Anahtar	 Vida Gresi	 Sıkma vidası	 Tork tornavidası.
	80 950 ...	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
Yedek parçalar					
CW					
3	**032**	**109**	**303**	**858**	**191**
4	**033**	**110**	**303**	**218**	**191**
6	**036**	**113**	**303**	**101**	**192**
8	**037**	**114**	**303**	**135**	**192**
10	**037**	**114**	**303**	**146**	**192**

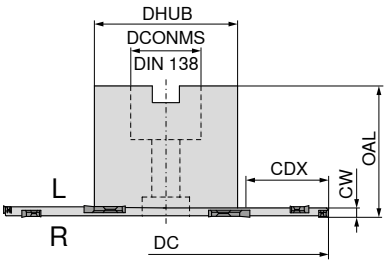
TX takma, ayırıcı disk freze

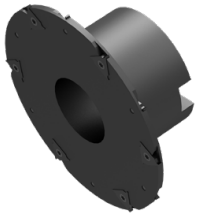
▲ Dikkat: TX kanal freze çapraz dişli olup hem sağ hem de sol uçlarla birlikte kullanılmaktadır.
▲ ZEFP = Uç sayısı

Teslimat kapsamı:

Kanal freze, 2 yedek sıkıştırma vidası ve 1 tork-anahtar







50 734 ...

Tanımlama	DC mm	CW mm	ZNF	CDX mm	DCONMS mm	DHUB mm	OAL mm	ZEFP	Sıkma momenti Nm	Uç	
TX.ASF.100.R.03.Z5	100	3	5	25,0	27	48	50	10	0,7	TX. 161702	**300**
TX.ASF.125.R.03.Z6	125	3	6	37,5	27	48	50	12	0,7	TX. 161702	**225**
TX.ASF.160.R.03.Z8	160	3	8	44,0	40	70	50	16	0,7	TX. 161702	**260** 1)
TX.ASF.100.R.04.Z5	100	4	5	25,0	27	48	50	10	3,2	TX. 162302	**100**
TX.ASF.125.R.04.Z6	125	4	6	37,5	27	48	50	12	3,2	TX. 162302	**025**
TX.ASF.125.R.04.Z6	125	4	6	26,5	40	70	50	12	3,2	TX. 162302	**125**
TX.ASF.160.R.04.Z8	160	4	8	55,0	27	48	50	16	3,2	TX. 162302	**060** 1)
TX.ASF.160.R.04.Z8	160	4	8	44,0	40	70	50	16	3,2	TX. 162302	**160** 1)
TX.ASF.180.R.04.Z9	180	4	9	54,0	40	70	50	18	3,2	TX. 162302	**180** 1)
TX.ASF.200.R.04.Z10	200	4	10	64,0	40	70	50	20	3,2	TX. 162302	**200** 1)

1) İçten soğutmasız.


Altlık

Tork çubuğu


Tesbit vidası


D-Anahtar


Vida Gresi


Sıkma vidası

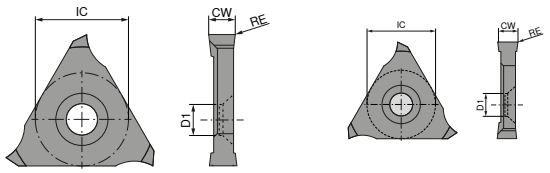

Tork tornavidası.

		70 950 ...	80 950 ...	70 950 ...	80 950 ...	70 950 ...	70 950 ...	80 950 ...
Yedek parçalar								
CW	**DCONMS**							
3	27	**221**	**032**	**219**	**109**	**303**	**858**	**191**
3	40	**222**	**032**	**220**	**109**	**303**	**858**	**191**
4	27	**221**	**033**	**219**	**110**	**303**	**218**	**192**
4	40	**222**	**033**	**220**	**110**	**303**	**218**	**192**

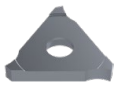
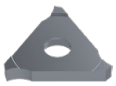
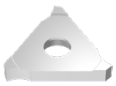
15

TX-L / TX-R

Tanımlama	IC mm	D1 mm	CW mm
TX . 1617..	10	3,95	1,7
TX . 1623..	10	3,95	2,3
TX . 2232..	13	5,50	3,2
TX . 2243..	13	5,50	4,3
TX . 2254..	13	5,50	5,4



TX_L / TX_R

		CWX500	CWX500	CWK10	CWK10
					
		TX-L	TX-R	TX-L	TX-R
		50 382 ...	**50 381 ...**	**50 382 ...**	**50 381 ...**
ISO	RE mm				
TX 161702	0,15	**217**	**217**		
TX 162302	0,15	**223**	**223**		
TX 223202	0,15	**232**	**232**		
TX 223202	0,20			**532**	**532**
TX 224302	0,15	**243**	**243**		
TX 224302	0,20			**543**	**543**
TX 225402	0,15	**254**	**254**		
TX 225402	0,20			**554**	**554**
P		●	●		
M		●	●		
K		●	●		
N		●	●	●	●
S		○	○		
H					
O		○	○	○	○

Frezeleme rehberi

Kesme değerleri tablosu	→ 192	Teknik Bilgiler	→ 193–198
Talaş kırıcı açıklaması ve talaş kırıcılara genel bakış	→ 199–201	Tür tanımı ve genel bakış	→ 202–208

Kesme verileri tablolarına ilişkin malzeme örnekleri

	Malzeme alt grubu	Dizin	Bileşim / yapı / ısıl işlem		Çekme mukavemeti N/mm²* / HB / HRC	Malzeme numarası	Malzeme tanımı	Malzeme numarası	Malzeme tanımı
P	Alaşımsız çelik	P.1.1	< 0,15 % C	tavlanmış	420 N/mm² / 125 HB	1.0401	C15	1.1141	Ck15
		P.1.2	< 0,45 % C	tavlanmış	640 N/mm² / 190 HB	1.1191	C45E	1.0718	9SMnPb28
		P.1.3		temperlenmiş	840 N/mm² / 250 HB	1.1191	C45E	1.0535	C55
		P.1.4	< 0,75 % C	tavlanmış	910 N/mm² / 270 HB	1.1223	C60R	1.0535	C55
		P.1.5		temperlenmiş	1010 N/mm² / 300 HB	1.1223	C60R	1.0727	45S20
	Düşük alaşımlı çelik	P.2.1		tavlanmış	610 N/mm² / 180 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.2		temperlenmiş	930 N/mm² / 275 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.3		temperlenmiş	1010 N/mm² / 300 HB	1.7225	42CrMo4	1.3505	100Cr6
		P.2.4		temperlenmiş	1200 N/mm² / 375 HB	1.7225	42CrMo4	1.3505	100Cr6
	Yüksek alaşımlı çelik ve yüksek alaşımlı takım çeliği	P.3.1		tavlanmış	680 N/mm² / 200 HB	1.4021	X20Cr13	1.4034	X46Cr13
		P.3.2		sertleştirilmiş ve temperlenmiş	1100 N/mm² / 300 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
		P.3.3		sertleştirilmiş ve temperlenmiş	1300 N/mm² / 400 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
	Paslanmaz çelik	P.4.1	ferritik / martensitik	tavlanmış	680 N/mm² / 200 HB	1.4016	X6Cr17	1.2316	X36CrMo16
		P.4.2	martensitik	temperlenmiş	1010 N/mm² / 300 HB	1.4112	X90CrMoV18	1.2316	X36CrMo16
M	Paslanmaz çelik	M.1.1	östenitik / östenitik-ferritik	su verilmiş	610 N/mm² / 180 HB	1.4301	X5CrNi18-10	1.4571	X6CrNiMoTi17-12-2
		M.2.1	östenitik	temperlenmiş	300 HB	1.4841	X15CrNiSi25-21	1.4539	X1NiCrMoCu25-20-5
		M.3.1	östenitik / ferritik (dubleks)		780 N/mm² / 230 HB	1.4462	X2CrNiMoN22-5-3	1.4501	X2CrNiMoCuWN25-7-4
K	Gri dökme demir	K.1.1	perlitik / ferritik		350 N/mm² / 180 HB	0.6010	GG-10	0.6025	GG-25
		K.1.2	perlitik (martensitik)		500 N/mm² / 260 HB	0.6030	GG-30	0.6045	GG-45
	Küresel grafitli dökme demir	K.2.1	ferritik		540 N/mm² / 160 HB	0.7040	GGG-40	0.7060	GGG-60
		K.2.2	perlitik		845 N/mm² / 250 HB	0.7070	GGG-70	0.7080	GGG-80
	Temper döküm	K.3.1	ferritik		440 N/mm² / 130 HB	0.8035	GTW-35-04	0.8045	GTW-45
		K.3.2	perlitik		780 N/mm² / 230 HB	0.8165	GTS-65-02	0.8170	GTS-70-02
N	Alüminyum yoğurma alaşımı	N.1.1	sertleştirilemez		60 HB	3.0255	Al99,5	3.3315	AlMg1
		N.1.2	sertleştirilebilir	sertleştirilmiş	340 N/mm² / 100 HB	3.1355	AlCuMg2	3.2315	AlMgSi1
	Alüminyum döküm alaşımları	N.2.1	≤ 12 % Si, sertleştirilemez		250 N/mm² / 75 HB	3.2581	G-AlSi12	3.2163	G-AlSi9Cu3
		N.2.2	≤ 12 % Si, sertleştirilebilir	sertleştirilmiş	300 N/mm² / 90 HB	3.2134	G-AlSi5Cu1Mg	3.2373	G-AlSi9Mg
		N.2.3	> 12 % Si, sertleştirilemez		440 N/mm² / 130 HB		G-AlSi17Cu4Mg		G-AlSi18CuNiMg
	Bakır ve bakır alaşımları (Bronz, Pirinç)	N.3.1	Otomat alaşımları, PB > 1 %		375 N/mm² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0410	CuZn44Pb2
		N.3.2	CuZn, CuSnZn		300 N/mm² / 90 HB	2.0331	CuZn15	2.4070	CuZn28Sn1As
		N.3.3	CuSn, kurşunsuz bakır ve elektrolitik bakır		340 N/mm² / 100 HB	2.0060	E-Cu57	2.0590	CuZn40Fe
	Magnezyum alaşımları	N.4.1	Magnezyum ve magnezyum alaşımları		70 HB	3.5612	MgAl6Zn	3.5312	MgAl3Zn
S	Isıya dayanıklı alaşımlar	S.1.1	FE bazlı	tavlanmış	680 N/mm² / 200 HB	1.4864	X12NiCrSi 36-16	1.4865	G-X40NiCrSi38-18
		S.1.2		sertleştirilmiş	950 N/mm² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4876	X10NiCrAlTi32-20
		S.2.1	Ni veya Co bazlı	tavlanmış	840 N/mm² / 250 HB	2.4631	NiCr20TiAl (Nimonic80A)	3.4856	NiCr22Mo9Nb
		S.2.2		sertleştirilmiş	1180 N/mm² / 350 HB	2.4668	NiCr19Nb5Mo3 (Inconel 718)	2.4955	NiFe25Cr20NbTi
		S.2.3		dökülmüş	1080 N/mm² / 320 HB	2.4765	CoCr20W15Ni	1.3401	G-X120Mn12
	Titanyum alaşımları	S.3.1	Saf titanyum		400 N/mm²	3.7025	Ti99,8	3.7034	Ti99,7
		S.3.2	Alfa- + Beta alaşımları	sertleştirilmiş	1050 N/mm² / 320 HB	3.7165	TiAl6V4	Ti-6246	Ti-6Al-2Sn-4Zr-6Mo
		S.3.3	Beta alaşımları		1400 N/mm² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr	R56410	Ti-10V-2Fe-3Al
H	Sertleştirilmiş çelik	H.1.1		sertleştirilmiş ve temperlenmiş	46–55 HRC				
		H.1.2		sertleştirilmiş ve temperlenmiş	56–60 HRC				
		H.1.3		sertleştirilmiş ve temperlenmiş	61–65 HRC				
		H.1.4		sertleştirilmiş ve temperlenmiş	66–70 HRC				
	Sert döküm	H.2.1		dökülmüş	400 HB				
	Sertleştirilmiş dökme demir	H.3.1		sertleştirilmiş ve temperlenmiş	55 HRC				
O	Metal dışı malzemeler	O.1.1	Plastikler, termoset plastik		≤ 150 N/mm²				
		O.1.2	Plastikler, termoplastik		≤ 100 N/mm²				
		O.2.1	aramid elyaf takviyeli		≤ 1000 N/mm²				
		O.2.2	cam / karbon elyaf takviyeli		≤ 1000 N/mm²				
		O.3.1	Grafit						

* çekme mukavemeti

Kesme değerleri tablosu

İçindekiler	CTEP210 CERMET DRAGONSKIN		TCM10 CERMET DRAGONSKIN		CTCP220 DRAGONSKIN		CTPP225 DRAGONSKIN		CTCP230 DRAGONSKIN		CTPP231		CTPP235 DRAGONSKIN		CTPP236	
	Uç kalitesi **sert** (v_c↑) → **tok** (v_c↓)															
	v_c (m/dak)															
P.1.1	**344**		**292**		**339**	**170**	**263**	**157**	**286**	**150**	**200**	**100**	**246**	**137**	**300**	**180**
P.1.2	**302**		**257**		**308**	**154**	**234**	**143**	**242**	**133**	**170**	**90**	**208**	**121**	**270**	**160**
P.1.3	**263**		**224**		**280**	**140**	**207**	**129**	**202**	**118**	**140**	**80**	**172**	**106**	**225**	**130**
P.1.4	**250**		**214**		**270**	**135**	**198**	**125**	**189**	**112**	**170**	**90**	**160**	**101**	**270**	**160**
P.1.5	**230**		**197**		**256**	**128**	**185**	**118**	**169**	**105**	**160**	**90**	**143**	**94**	**240**	**140**
P.2.1	**308**		**262**		**313**	**157**	**238**	**145**	**249**	**136**	**170**	**90**	**214**	**123**	**270**	**160**
P.2.2	**246**		**211**		**268**	**134**	**196**	**124**	**185**	**111**	**130**	**70**	**157**	**100**	**200**	**120**
P.2.3	**230**		**197**		**256**	**128**	**185**	**118**	**169**	**105**	**170**	**90**	**143**	**94**	**270**	**160**
P.2.4	**181**		**157**		**220**	**110**	**151**	**102**	**118**	**85**	**120**	**60**	**98**	**76**	**180**	**110**
P.3.1					**140**	**70**	**130**	**65**	**140**	**87**	**170**	**90**	**121**	**97**	**270**	**160**
P.3.2					**95**	**50**	**100**	**50**	**90**	**55**	**140**	**80**	**108**	**83**	**180**	**140**
P.3.3					**50**	**30**	**70**	**35**	**40**	**22**	**120**	**70**	**96**	**69**	**150**	**120**
P.4.1					**140**	**70**	**130**	**65**	**140**	**87**	**140**	**80**	**121**	**97**	**180**	**140**
P.4.2					**118**	**60**	**115**	**58**	**115**	**71**	**130**	**70**	**114**	**90**	**170**	**130**
M.1.1											**170**	**90**	**121**	97	**270**	**160**
M.2.1													**108**	83		
M.3.1													117	93		
K.1.1									310	190	**150**	**110**	160	110	**360**	**90**
K.1.2	300		**240**						160	100	**150**	**110**	150	110	**360**	**90**
K.2.1	350		280						200	120	**150**	**110**	150	110	**230**	**170**
K.2.2	300		240						130	80	**150**	**110**	150	110	**160**	**110**
K.3.1	300		240						190	115					**210**	**160**
K.3.2									160	100					**210**	**160**
N.1.1																
N.1.2																
N.2.1																
N.2.2																
N.2.3																
N.3.1																
N.3.2																
N.3.3																
N.4.1																
S.1.1																
S.1.2																
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S.3.3																
H.1.1																
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H.1.3																
H.1.4																
H.2.1																
H.3.1																
O.1.1																
O.1.2																
O.2.1																
O.2.2																
O.3.1																

Kesme verileri, örn. takım ve iş parçası bağlama stabilitesi, malzeme ve makine tipi gibi harici koşullara çok bağlıdır! Belirtilen değerler, kullanım koşullarına bağlı olarak yakl. **±%20** düzeltilmesi gereken olası kesme verilerini temsil eder!

Kesme değerleri tablosu

İçindekiler	CTPM225		CTCM235		CTPM240		CTPM241		CTPM245		CTCM245		CTN3105		CTL3215	
													CERAMIC		CBN	
	DRAGONSKIN															
	Uç kalitesi **sert** (v_c↑) → **tok** (v_c↓)															
	v_c (m/dak)															
P.1.1	272	191	251	184	226	141	200	100	244	139	279	134				
P.1.2	231	163	210	152	188	126	170	90	207	124	242	119				
P.1.3	193	137	172	123	152	112	140	70	173	109	208	104				
P.1.4	180	129	160	113	140	107	170	90	161	104	196	99				
P.1.5	161	116	141	99	123	100	150	80	144	97	179	92				
P.2.1	237	167	217	157	194	128	170	90	212	126	247	121				
P.2.2	177	127	157	111	137	106	120	60	158	103	193	98				
P.2.3	161	116	141	99	123	100	170	90	144	97	179	92				
P.2.4	114	84	94	62	78	83	110	60	101	78	136	73				
P.3.1	148	121	136	115	126	105	210	100	155	107	175	122				
P.3.2	121	101	128	110	112	95	180	100	143	93	163	108				
P.3.3	95	81	120	105	98	85	160	90	131	79	151	94				
P.4.1	148	121	136	115	126	105	140	90	155	107	175	122				
P.4.2	134	111	132	113	119	100	130	80	149	100	169	115				
M.1.1	**148**	**121**	**136**	**115**	**126**	**105**	**210**	**100**	**155**	**107**	**175**	**122**				
M.2.1	**121**	**101**	**128**	**110**	**112**	**95**	**180**	**90**	**143**	**93**	**163**	**108**				
M.3.1	**140**	**115**	**134**	**114**	**121**	**102**	**210**	**100**	**152**	**103**	**172**	**118**				
K.1.1													**800**		**800**	
K.1.2													**600**		**600**	
K.2.1																
K.2.2															**450**	
K.3.1																
K.3.2																
N.1.1																
N.1.2																
N.2.1																
N.2.2																
N.2.3																
N.3.1																
N.3.2																
N.3.3																
N.4.1																
S.1.1								60				80				
S.1.2								60				70				
S.2.1								60				35				
S.2.2								60				25				
S.2.3								60				30				
S.3.1								60				80				
S.3.2								60				50				
S.3.3								60				40				
H.1.1																
H.1.2															150	
H.1.3																
H.1.4																
H.2.1															280	
H.3.1																
O.1.1																
O.1.2																
O.2.1																
O.2.2																
O.3.1																

Kesme verileri, örn. takım ve iş parçası bağlama stabilitesi, malzeme ve makine tipi gibi harici koşullara çok bağlıdır! Belirtilen değerler, kullanım koşullarına bağlı olarak yakl. **±%20** düzeltilmesi gereken olası kesme verilerini temsil eder!

Kesme değerleri tablosu

İçindekiler	CTCK215		CTPK220		CTPK221		CTPX715		H216T		CTWN215		CTC5240		CTCS245		CTP6215	
	DRAGONSKIN		DRAGONSKIN				DRAGONSKIN						DRAGONSKIN					
	Uç kalitesi **sert** (v_c↑) → **tok** (v_c↓)																	
	v_c (m/dak)																	
P.1.1					190	120	240	130										
P.1.2					180	100	200	120										
P.1.3					150	80	170	100										
P.1.4					180	100	160	100										
P.1.5					170	90	140	90										
P.2.1					180	100	210	120										
P.2.2					140	80	150	100										
P.2.3					180	100	140	90										
P.2.4					130	80	100	70										
P.3.1					210	120	120	90										
P.3.2					160	90	100	80										
P.3.3					130	80	90	70										
P.4.1					210	120	120	90										
P.4.2					190	100	110	90										
M.1.1							120	100										
M.2.1							110	90										
M.3.1							120	100										
K.1.1	360	210	320	190	270	200	**320**	190	130	130	130	130					280	250
K.1.2	220	130	170	100	270	200	**170**	100	110	110	110	110					190	160
K.2.1	230	140	210	130	250	180	**210**	130	130	130	130	130					180	150
K.2.2	160	100	140	90	180	120	**140**	90	120	120	120	120					180	150
K.3.1	250	150	200	120	220	170	**200**	120	130	130	130	130					250	220
K.3.2	210	130	170	100	220	170	**170**	100	110	120	110	110					190	160
N.1.1								**1500**		**1500**		**1500**						
N.1.2								**1000**		**1000**		**1000**						
N.2.1								**1100**		**1100**		**1100**						
N.2.2								**1000**		**1000**		**1000**						
N.2.3								**280**		**280**		**280**						
N.3.1								**350**		**350**		**350**						
N.3.2								**350**		**350**		**350**						
N.3.3								**320**		**320**		**320**						
N.4.1								**320**		**320**		**320**						
S.1.1								60						**80**		**64**		
S.1.2								50						**70**		**56**		
S.2.1								30						**35**		**28**		
S.2.2								20						**25**		**20**		
S.2.3								20						**30**		**24**		
S.3.1								60						**80**		**64**		
S.3.2								40						**50**		**40**		
S.3.3								30						**40**		**32**		
H.1.1																	**50**	
H.1.2																	**40**	
H.1.3																		
H.1.4																		
H.2.1																		
H.3.1																		
O.1.1							160	160	160	160	160	160						
O.1.2																		
O.2.1							240	240	240	240	240	240						
O.2.2																		
O.3.1																		

Kesme verileri, örn. takım ve iş parçası bağlama stabilitesi, malzeme ve makine tipi gibi harici koşullara çok bağlıdır! Belirtilen değerler, kullanım koşullarına bağlı olarak yakl. **±%20** düzeltilmesi gereken olası kesme verilerini temsil eder!

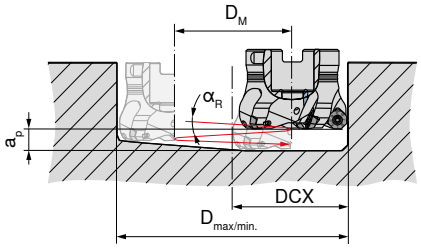
Sistem MaxiMill 274-04/-09

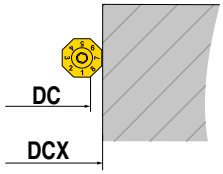
İşleme stratejisi

Helisel dalma



$D_{max.}$ mm = Düz zemin için en büyük çap ölçüsü
$D_{min.}$ mm = Düz tabanlı en küçük delik çapı
D_M = D_{maks} – DCX veya D_{min} – DCX





OF..04

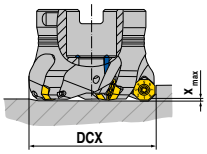
DC mm	DCX mm	D_{max} mm	D_{min} mm	$\alpha_{R\,max}$ °
20	**25,5**	45	39	2,3
25	**30,6**	55	49	1,9
32	**37,6**	69	63	1,4
40	**45,7**	85	79	1,2
50	**55,7**	105	99	0,9
63	**68,7**	131	125	0,7
80	**85,7**	165	159	0,6
100	**105,7**	205	199	0,5
125	**130,7**	255	249	0,4

SF..09

DC mm	DCX mm	D_{max} mm	D_{min} mm	$\alpha_{R\,max}$ °
18,8	**27,4**	45,00	42,0	1,9
23,8	**32,5**	55,00	52,0	1,5
30,7	**39,5**	69,00	66,0	1,1
38,7	**47,6**	85,00	82,0	0,9
48,6	**57,6**	105,00	102,0	0,7
61,7	**70,6**	131,00	128,0	0,5
78,7	**87,5**	165,00	162,0	0,4
98,7	**107,5**	205,00	202,0	0,3
123,7	**132,5**	255,00	252,0	0,3

Eksenel dalma





OF..04

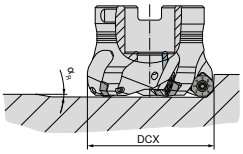
DC mm	DCX mm	x_{max} mm
20	**25,6**	2,5
25	**30,7**	2,5
32	**37,7**	2,5
40	**45,7**	2,5
50	**55,7**	2,5
63	**68,7**	2,5
80	**85,7**	2,5
100	**105,7**	2,5
125	**130,7**	2,5

SF..09

DC mm	DCX mm	x_{max} mm
18,8	**27,4**	3,7
23,8	**32,5**	3,5
30,7	**39,5**	3,2
38,7	**47,6**	3,1
48,6	**57,6**	3,1
61,7	**70,6**	3,0
78,7	**87,5**	2,9
98,7	**107,5**	2,7
123,7	**132,5**	2,7

Açılı frezeleme (Rampa)





OF..04

DC mm	DCX mm	$\alpha_{R\,max}$ °
20	**25,6**	14,2
25	**30,7**	9,5
32	**37,7**	6,5
40	**45,7**	4,7
50	**55,7**	3,5
63	**68,7**	2,7
80	**85,7**	2,0
100	**105,7**	1,6
125	**130,7**	1,2

SF..09

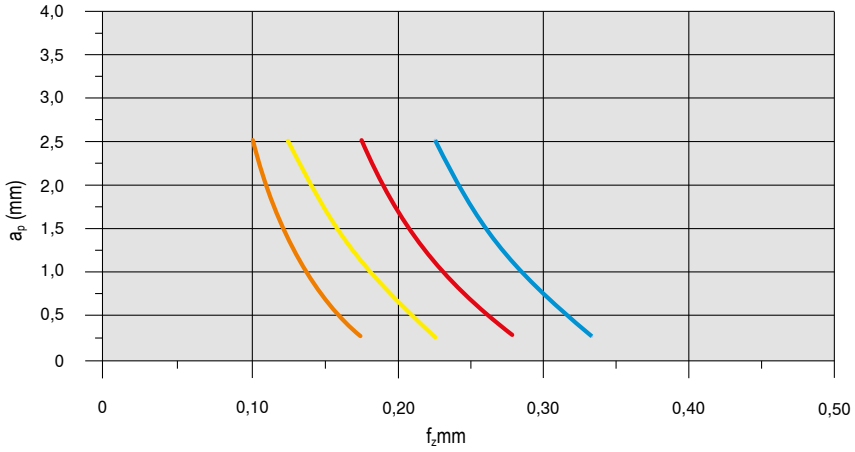
DC mm	DCX mm	$\alpha_{R\,max}$ °
18,8	**27,4**	20,4
23,8	**32,5**	13,0
30,7	**39,5**	8,0
38,7	**47,6**	5,8
48,6	**57,6**	4,3
61,7	**70,6**	3,2
78,7	**87,5**	2,3
98,7	**107,5**	1,7
123,7	**132,5**	1,3

Sistem MaxiMill 274-04

Başlangıç parametreleri



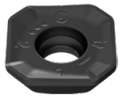
OF.. 04



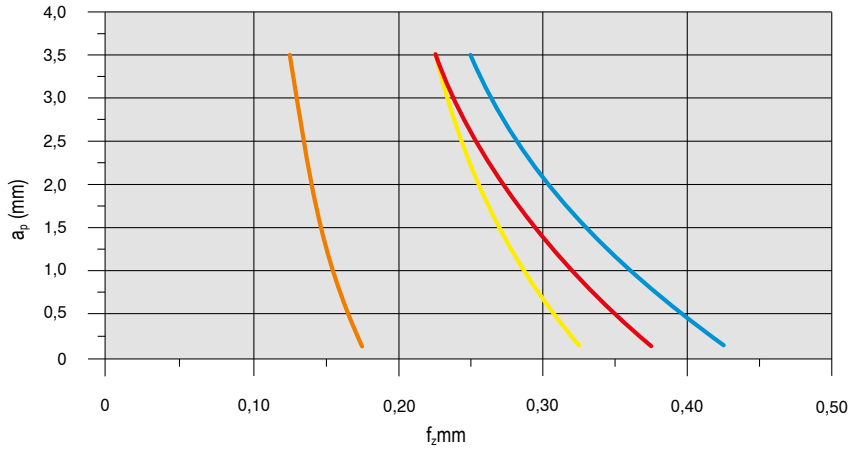
Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**OFHT040305SN-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**OFHT040305SN-F50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**OFHT040305SN-M50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**OFHT040305SN-F50**	**CTC5240**	35	Emülsiyon

Sistem MaxiMill 274-09

Başlangıç parametreleri



SF.. 09



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**SFKT0903AFSR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**SFHT0903AFSR-F50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**SFKT0903AFSR-R50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**SFHT0903AFSR-F50**	**CTC5240**	35	Emülsiyon

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

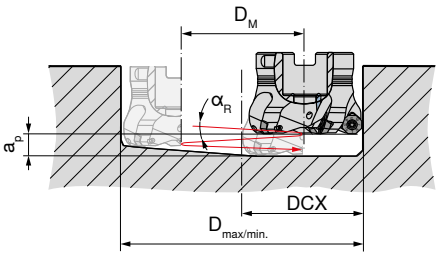
Sistem MaxiMill 274-05/-12

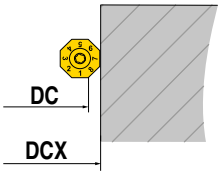
İşleme stratejisi

Helisel dalma



$D_{max.}$ mm = Düz zemin için en büyük çap ölçüsü
$D_{min.}$ mm = Düz tabanlı en küçük delik çapı
D_M = D_{maks} – DCX veya D_{min} – DCX





OF..05

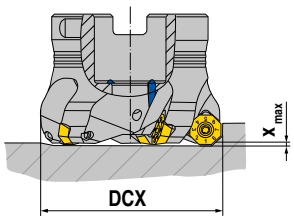
DC mm	DCX mm	D_{max} mm	D_{min} mm	$\alpha_{R\,max}$ °
40	**48**	87	85	1,6
50	**58**	107	99	1,1
63	**71**	133	125	0,9
80	**88**	167	159	0,7
100	**107,9**	207	199	0,5
125	**132,9**	257	249	0,4
160	**167,9**	327	325	0,35

SF..12

DC mm	DCX mm	D_{max} mm	D_{min} mm	$\alpha_{R\,max}$ °
47,0	**61,0**	107	105	0,5
59,9	**74,0**	133	131	0,4
76,9	**90,9**	167	165	0,3
96,9	**110,9**	207	205	0,25
121,9	**135,9**	257	255	0,2

Eksenel dalma





OF..05

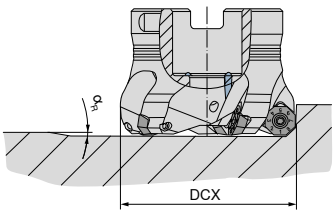
DC mm	DCX mm	X_{max} mm
40	**48**	2,5
50	**58**	2,2
63	**71**	1,9
80	**88**	1,8
100	**107,9**	1,1
125	**132,9**	1,4
160	**167,9**	1,1

SF..12

DC mm	DCX mm	X_{max} mm
47,0	**61,0**	3,4
59,9	**74,0**	3,2
76,9	**90,9**	3,0
96,9	**110,9**	2,5
121,9	**135,9**	2,6

Açılı frezeleme (Rampa)





OF..05

DC mm	DCX mm	$\alpha_{R\,max}$ °
40	**48**	6,5
50	**58**	3,2
63	**71**	2,0
80	**88**	1,5
100	**107,9**	0,7
125	**132,9**	0,7
160	**167,9**	0,4

SF..12

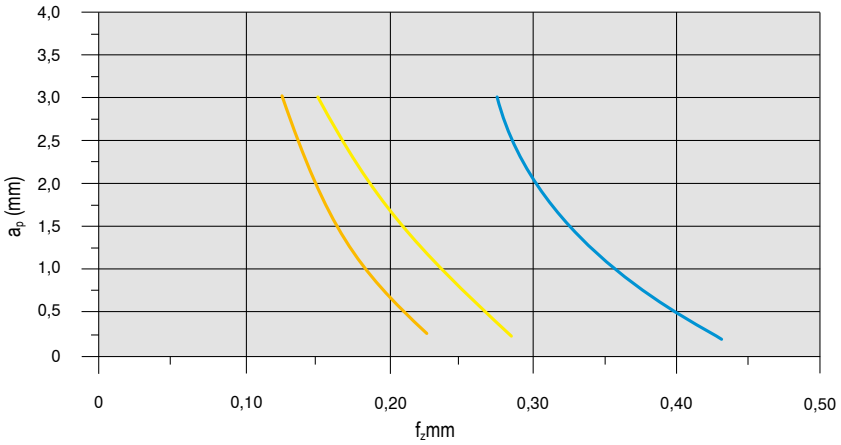
DC mm	DCX mm	$\alpha_{R\,max}$ °
47,0	**61,0**	4,9
59,9	**74,0**	3,4
76,9	**90,9**	2,4
96,9	**110,9**	1,6
121,9	**135,9**	1,3

Sistem MaxiMill 274-05

Başlangıç parametreleri



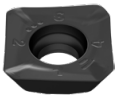
OF.. 05



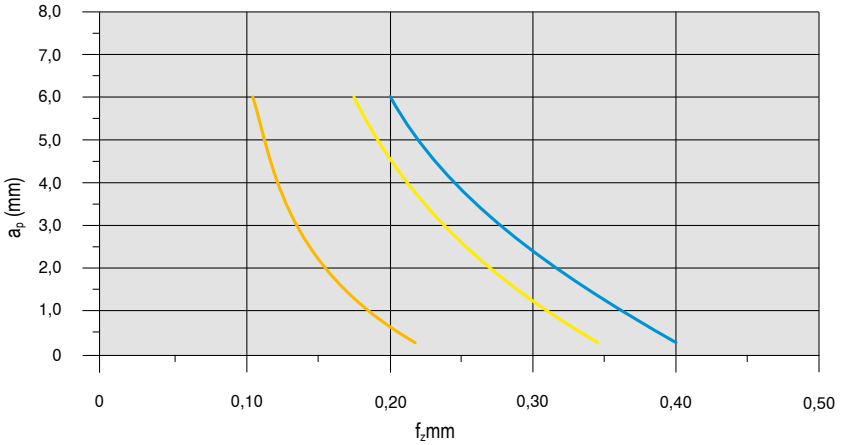
Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**OFHT050410SN-M50**	**CTCP230**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**OFHT050410SN-F50**	**CTPM240**	180	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**OFHT050410SN-F50**	**CTC5240**	35	Emülsiyon

Sistem MaxiMill 274-12

Başlangıç parametreleri



SF.. 12



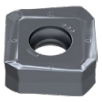
Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**SFKT1204AFSR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**SFKT1204AFSR-M50**	**CTPM240**	180	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**SFHT1204AFER-F40**	**CTC5240**	35	Emülsiyon

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

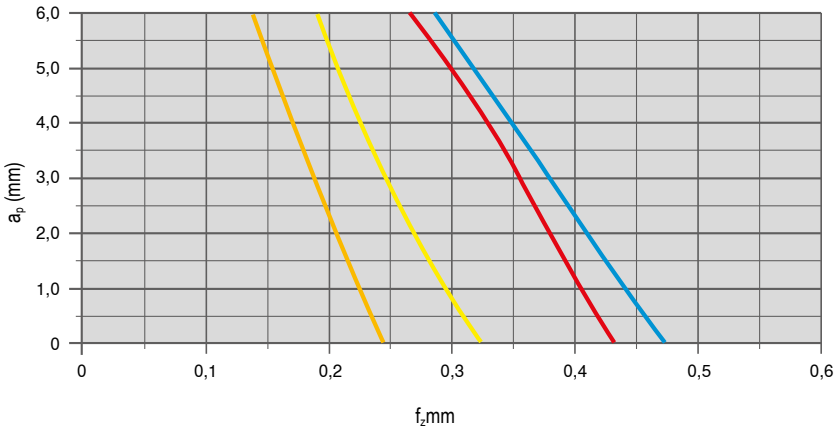
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

Sistem MaxiMill 271-12

Başlangıç parametreleri



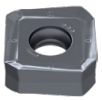
SOHU 12



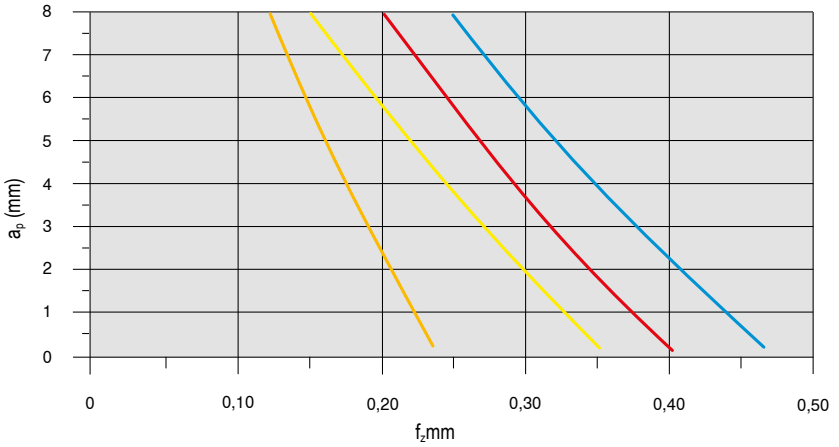
Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**SOHU 1204ABSR-M50**	**CTPP230**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**SOHU 1204ABSR-M50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**SOHU 1204ABSR-R50**	**CTCK215**	300	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**SOHU 1204ABSR-F50**	**CTC5240**	30	Emülsiyon

Sistem MaxiMill 271-17

Başlangıç parametreleri



SAKU 17



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**SAKU 1706ABSR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**SAKU 1706ABSR-F50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**SAKU 1706ABSR-R50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**SAKU 1706ABSR-F50**	**CTC5240**	35	Emülsiyon

15

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

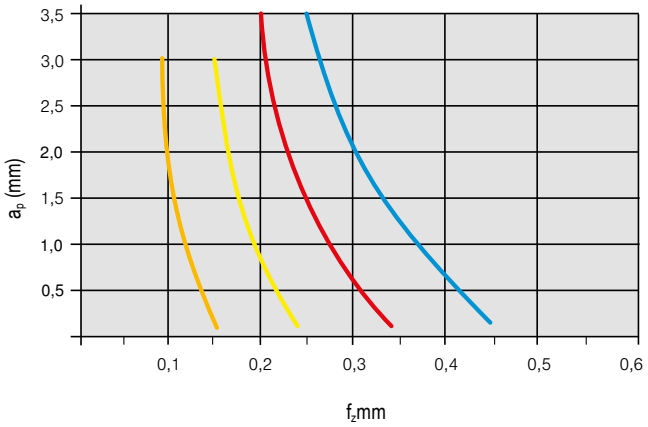
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

Sistem MaxiMill 273-06

Başlangıç parametreleri



OAKU 06



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**OAKU 060508SR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**OAKU 060508SR-F50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**OAKU 060508SR-R50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**OAKU 060508ER-F40**	**CTC5240**	35	Emülsiyon

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

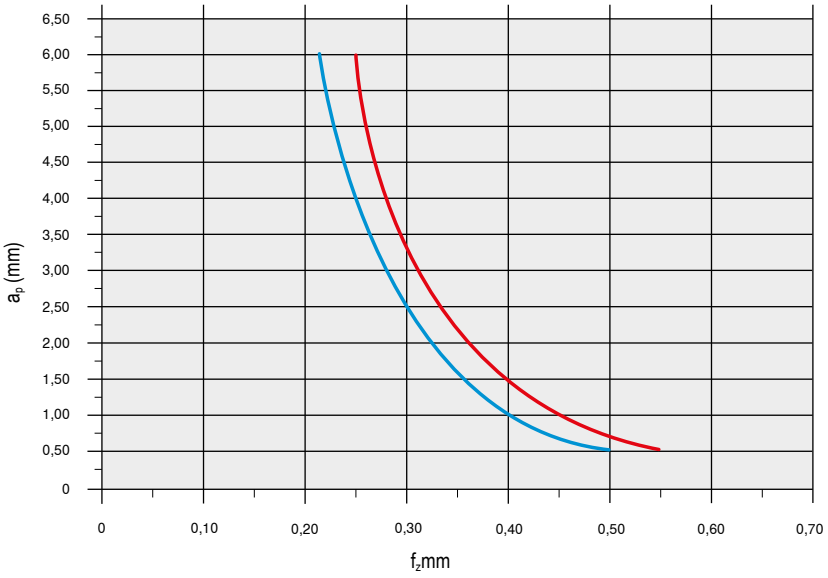
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

Sistem MaxiMill 273-08

Başlangıç parametreleri



ONKU 08



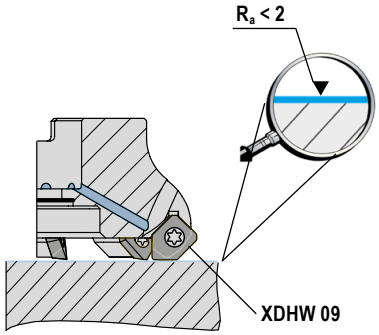
Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**ONKU 080608SR-M50**	**CTPP235**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**ONKU 080608SR-R50**	**CTCK215**	250	Kuru

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

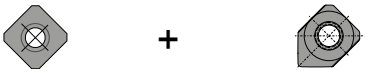
Sistem MaxiMill 270

İşleme stratejisi



Silicili uç ile finiş frezeleme

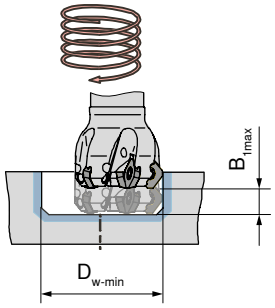
Ø 125 mm den büyük çaplı freze kafalarında iki adet silici uç bağlanır.



Çelik	SDNT	0903AESN-29	CTPP235	+	XDHW 0903AESN	CTPP235
	SDNT	0903AESN-29	CTCP230	+	XDHW 0903AESN	CTCP230
	SDHT	0903AESN-33	CTCP230	+	XDHW 0903AESN	CTCP230
	SDHW	0903AESN	TCM10	+	XDHW 0903AESN	TCM10
Dökme demir	SDNT	0903AESN-31	CTCK215	+	XDHW 0903AESEN	CTCK215
Demir dışı metaller	SDHT	0903AEFN-ALP	-27P H216T	+	XDHW 0903AEFN	-27P H216T

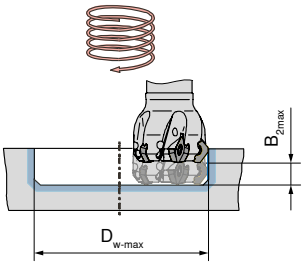
Helisel dalma (pilot delik açmadan)





C 270-09

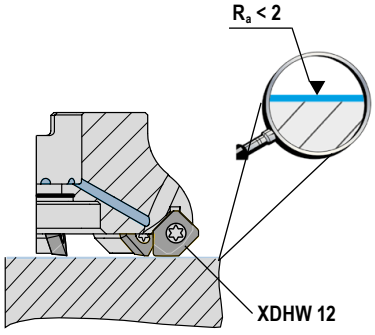
DC mm	D_{w-min} mm	$B_{1\,max}$ mm	D_{w-max} mm	$B_{2\,max}$ mm
6	14,4	1,5	19,0	1,5
12	28,5	1,5	31,0	1,5
16	36,5	1,5	39,0	1,5
20	44,5	1,5	47,0	1,5
25	54,5	1,5	57,0	1,5
32	68,5	1,5	71,0	1,5



A 270-09

DC mm	D_{w-min} mm	$B_{1\,max}$ mm	D_{w-max} mm	$B_{2\,max}$ mm
32	68,5	1,5	71,0	1,5
40	84,5	1,5	87,0	1,5
50	104,5	1,5	107,0	1,5
63	130,5	1,5	133,0	1,5
80	164,5	1,5	167,0	1,5
100	204,5	1,5	207,0	1,5
125	254,5	1,5	257,0	1,5
160	324,5	1,5	327,0	1,5

Sistem MaxiMill 270-12



Silicili uç ile finiş frezeleme

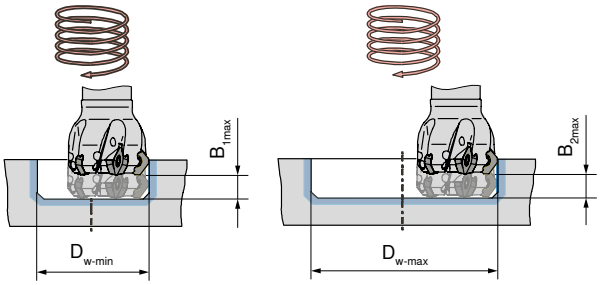
Ø 125 mm den büyük çaplı freze kafalarında iki adet silici uç bağlanır.



Çelik	SDMT	1204AESN-29R	CTPP235	+	XDHW 1204AESN	CTPP235
	SDMT	1204AESN-29R	CTCP230	+	XDHW 1204AESN	CTCP230
	SDHW	1204AESN-R	TCM10	+	XDHW 1204AESN	TCM10
Dökme demir	SDMT	1204AEEN-31	CTCK215	+	XDHW 1204AEEN	CTCK215
	SDHW	1204AESN-R	CTCK215	+	XDHW 1204AEEN	CTCK215
Demir dışı metaller	SDHT	1204AEFN-ALP	-27P H216T	+	XDHW 1204AEFN	-27P H216T

Helisel dalma (pilot delik açmadan)



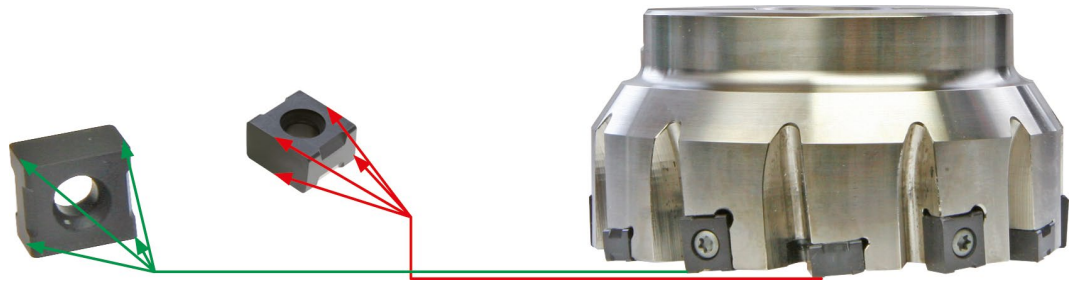


DC mm	D_{w-min} mm	$B_{1\,max}$ mm	D_{w-max} mm	$B_{2\,max}$ mm
32	74,5	1,5	78,0	1,5
40	90,5	1,5	94,0	1,5
50	110,5	1,5	114,0	1,5
63	136,5	1,5	140,0	1,5
80	170,5	1,5	174,0	1,5
100	210,5	1,5	214,0	1,5
125	260,5	1,5	264,0	1,5
160	330,5	1,5	334,0	1,5

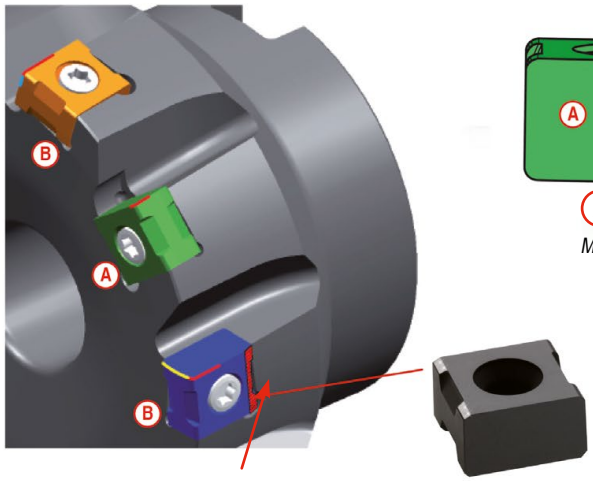
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

MaxiMill HEC 11 / HEC 12 sistemi

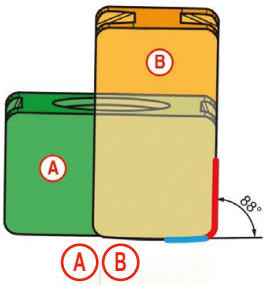
Montaj konumu başına 4 kesici kenar



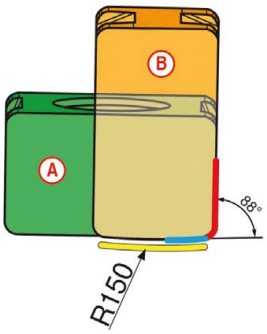
Standart ve silici uçların düzgün takılması



Silici ucun yerleştirme şekli



Montaj şekli



Yüzey freze standart ucu — B

Ucun esas kesme kenarı — A B

Silicili uç — B

Takımların eksenel yönde ayarlanması

- ▲ Ayar pabucunu şekildeki gibi freze gövdesindeki yuvasına yerleştirin ve vidasını (1) parça genişlemeye başlayıncaya kadar sıkın.
- ▲ Ucu takın ve (2) nolu vidayı 1,0 Nm kuvvetle sıkın.
- ▲ Takım ayar ünitesini kullanarak en yüksek ucu belirleyin.
- ▲ Pabucun ayar vidasını kullanarak kesici uçları 0,005 mm veya daha az bir sapma olacak şekilde ayarlayın.
- ▲ Uç vidalarını (2), 3,2 Nm kuvvetle sıkın.

1
2
1
1
2



15

Ortalama talaş kalınlığı [h_m] – Kural

Yüzey frezeleme

1 Tablodan çelik malzemeler için uygun ortalama talaş kalınlığı [h_m] değerini seçin.

Malzeme	Çekme mukavemeti N/mm²	h_m mm
Çelik için	...–800	0,2
Çelik için	800–1000	0,18
Çelik için	1000–1200	0,16
Çelik için	1200–...	0,14
Paslanmaz çelik için	... –750	0,21
Paslanmaz çelik için	750–900	0,19
Paslanmaz çelik için	900–1150	0,17
Paslanmaz çelik için	1150– ...	0,15

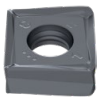
2 Tablodan uygun talaş kalınlığı (h_m) ve kesme derinliği (a_e) değerlerine uyan ilerlemeyi seçin.

h_m mm	h_m için düzeltilmiş ilerleme f_z değeri			
0,20	0,40 **	0,40 **	0,33	0,28
0,18	0,40 **	0,40 **	0,29	0,25
0,16	0,40 **	0,36	0,26	0,23
0,14	0,36	0,31	0,23	0,20
0,21	0,40 **	0,40 **	0,34	0,30
0,19	0,40 **	0,40 **	0,31	0,27
0,17	0,40 **	0,38	0,28	0,24
0,15	0,39	0,34	0,24	0,21
a_e =	**0,3 x DC**	**0,4 x DC**	**0,75 x DC**	**1 x DC**

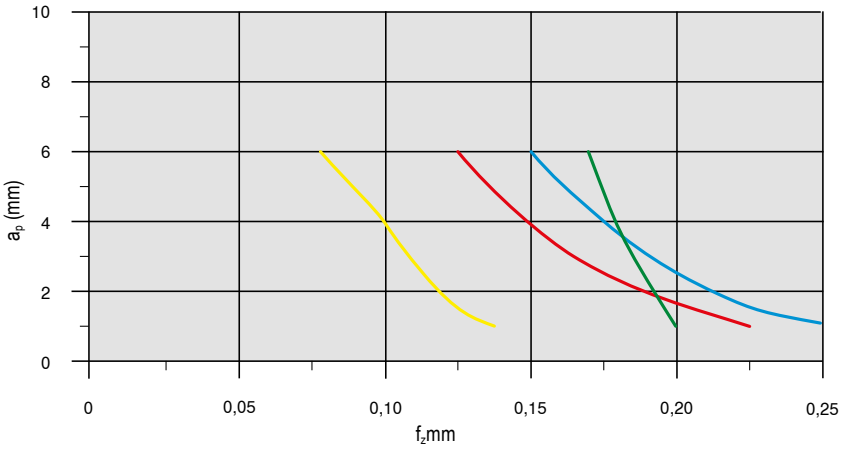
** f_z > 0,4 mm: Çok yüksek ilerleme nedeni ile tehlikelidir

Sistem MaxiMill 491-09

Başlangıç parametreleri



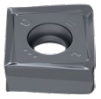
SNHU 09



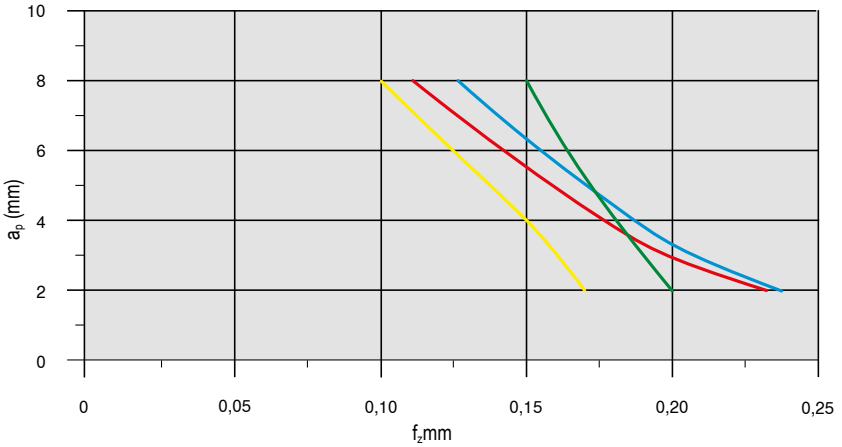
Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**SNHU09T308SR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**SNHU09T308SR-F50**	**CTPM240**	180	Emülsiyon
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**SNHU09T308SR-R50**	**CTCK215**	250	Kuru
Demir dışı metaller	**N.1.2**	AlMgSi1	**SNHU09T308FR-F10**	**CTWN215**	500	Emülsiyon

Sistem MaxiMill 491-12

Başlangıç parametreleri



SNHU 12



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**SNHU120408SR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**SNHU120408SR-F50**	**CTPM240**	180	Emülsiyon
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**SNHU120408SR-R50**	**CTCK215**	250	Kuru
Demir dışı metaller	**N.1.2**	AlMgSi1	**SNHU120408FR-F10**	**CTC5240**	500	Emülsiyon

15

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

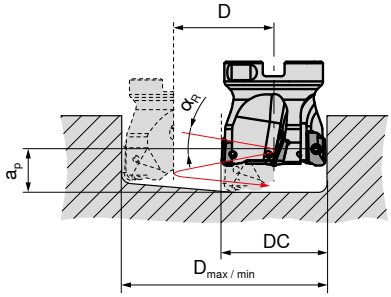
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

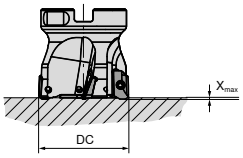
Sistem MaxiMill 211-07

İşleme stratejisi

Helisel dalma







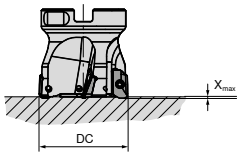
a_p (mm) = D * π * tan α_R

DC mm	D_{max} / RE 0,4 mm	D_{min} mm	$\alpha_{R\,max}$ °
10	19	13	5,5
12	23	17	6,0
16	31	25	3,0
20	39	33	2,0
25	49	43	1,5
32	63	57	1,2
40	79	73	0,8
50	99	93	0,7

DC mm	D mm	$\alpha_{R\,max\,360°}$ °
10	13	5,5
12	17	6,0
16	25	3,0
20	33	2,0
25	43	1,5
32	57	1,2
40	73	0,8
50	93	0,7

Eksenel dalma



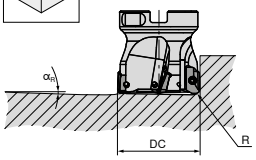


DC mm	X_{max} mm
10	0,8
12	0,8
16	0,8
20	0,8
25	0,8
32	0,8
40	0,8
50	0,8

$D_{max.}$ mm = Düz zemin için en büyük çap ölçüsü
$D_{min.}$ mm = Düz tabanlı en küçük delik çapı

Açılı frezeleme (Rampa)

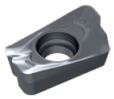




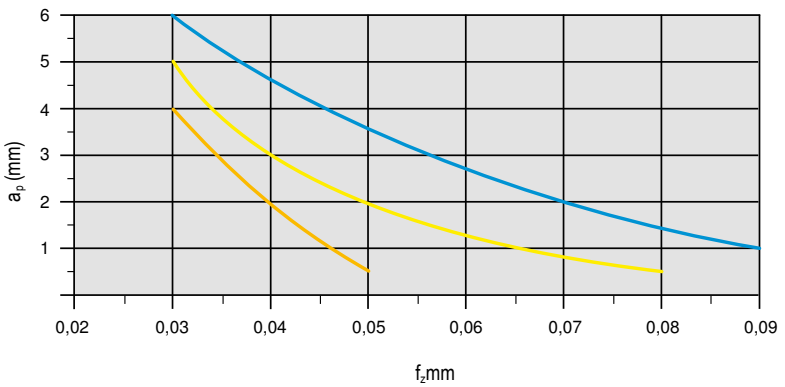
DC mm	α °
10	11,0
12	7,9
16	4,3
20	3,0
25	2,5
32	1,6
40	1,2
50	1,0

D = D_{max} - DC / D_{min} - DC

Başlangıç parametreleri



XDKT 07



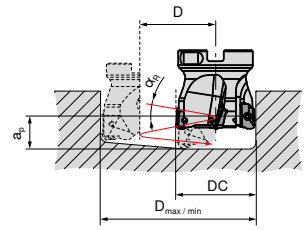
Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	P.2.2	40CrMnMoS 8-6	XDKT070308SR-M50	CTCP230	200	Kuru
Paslanmaz çelik	M.1.1	X6CrNiMoTi 1712 2	XDKT070308SR-F50	CTPM240	180	Kuru
Isıya dayanıklı alaşımlar	S.2.2	Inconel 718	XDKT070308ER-F50	CTC5240	35	Emülsiyon

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

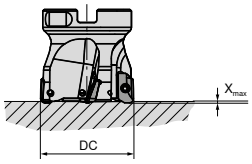
Sistem MaxiMill 211-11

İşleme stratejisi



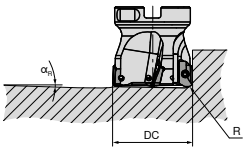
1 Helisel dalma





2 Eksenel dalma





3 Açılı frezeleme (Rampa)



DC mm	1 Helisel dalma RE = 0,8 mm	2 Eksenel dalma X_{max}	3 Açılı frezeleme (Rampa) α_R
12	α_R 16 ° $D_{max.}$ 21 mm $D_{min.}$ 14 mm	1,3 mm	18 °
16	α_R 9,5 ° $D_{max.}$ 29 mm $D_{min.}$ 21 mm	1,5 mm	10,8 °
20	α_R 7 ° $D_{max.}$ 37 mm $D_{min.}$ 30 mm	2,0 mm	9,8 °
25	α_R 4,5 ° $D_{max.}$ 47 mm $D_{min.}$ 40 mm	2,0 mm	7,5 °
32	α_R 3,2 ° $D_{max.}$ 61 mm $D_{min.}$ 53 mm	1,0 mm	4,8 °
40	α_R 2,2 ° $D_{max.}$ 77 mm $D_{min.}$ 72 mm	1,6 mm	2,9 °
50	α_R 1,7 ° $D_{max.}$ 98 mm $D_{min.}$ 93 mm	1,6 mm	2,2 °
63	α_R 1,5 ° $D_{max.}$ 123 mm $D_{min.}$ 116 mm	1,6 mm	1,8 °
80	α_R 1,0 ° $D_{max.}$ 157 mm $D_{min.}$ 153 mm	1,6 mm	1,4 °
100	α_R 0,8 ° $D_{max.}$ 197 mm $D_{min.}$ 193 mm	1,6 mm	1,1 °
125	α_R 0,6 ° $D_{max.}$ 247 mm $D_{min.}$ 243 mm	1,6 mm	0,8 °

$D_{max.}$ mm = Düz zemin için en büyük çap ölçüsü

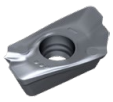
$D_{min.}$ mm = düz taban yüzeyi için en küçük delik çapı

a_p (mm) = $D \times \pi \times \tan(\alpha_R)$ = Hatve

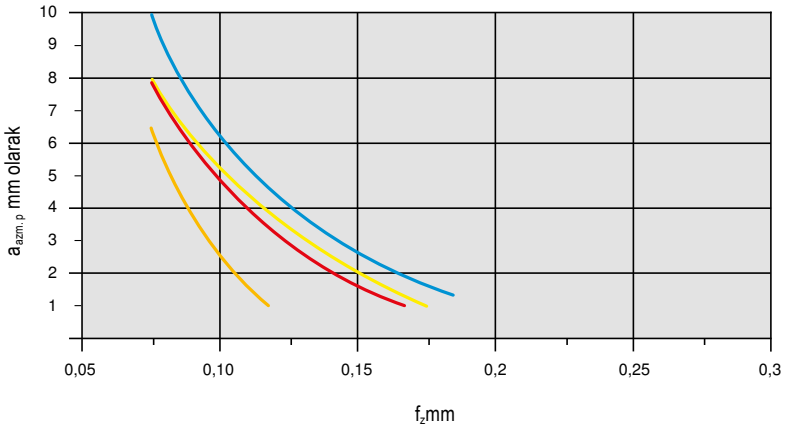
l_a mm = Tutucudan çıkma miktarı

DC mm	Çıkıntı uzunluğuna bağlı azami devir sayısı n_{max} in min^{-1} l_a = 1–2 x Ø mm	l_a = 2,5 x Ø mm	l_a = 3 x Ø mm	l_a = 4 x Ø mm	l_a = 5 x Ø mm
12	55000	51500	47000	42000	37000
16	42000	38500	34100	28900	24200
20	36900	33000	28500	23900	19500
25	33200	29000	24400	19900	15400
32	30200	26000	20900	16600	11900
40	27700	23000	18000	13500	9000
50	25400	20400	15400	10800	6100
63	23300	18300	12900	8300	3700
80	21300	16100	10600	5800	
100	19600	14100	8400		
125	17900	12800	7600		

Başlangıç parametreleri



XDKT 11



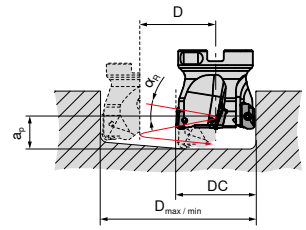
Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	P.2.2	40CrMnMoS 8-6	XDKT11T308SR-M50	CTCP230	200	Kuru
Paslanmaz çelik	M.1.1	X6CrNiMoTi 1712 2	XDKT11T308SR-F50	CTPM240	180	Kuru
Dökme demir	K.1.1	EN-GJL-250 (GG25)	XDKT11T308SR-R50	CTCK215	250	Kuru
Isıya dayanıklı alaşımlar	S.2.2	Inconel 718	XDKT11T308ER-F50	CTC5240	35	Emülsiyon

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

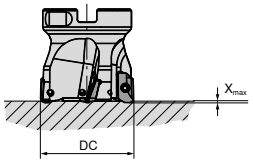
Sistem MaxiMill 211-15

İşleme stratejisi



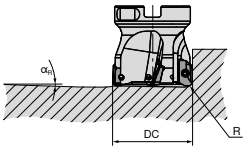
① Helisel dalma





② Eksenel dalma





③ Açılı frezeleme (Rampa)



DC mm		① Helisel dalma RE = 0,8 mm	② Eksenel dalma X_{max}	③ Açılı frezeleme (Rampa) α_R
25	α_R	7,5 °	2,7 mm	9,5 °
	$D_{max.}$	48 mm		
	$D_{min.}$	37 mm		
32	α_R	5 °	2,5 mm	6,8 °
	$D_{max.}$	62 mm		
	$D_{min.}$	47 mm		
40	α_R	3,2 °	2,5 mm	5,1 °
	$D_{max.}$	78 mm		
	$D_{min.}$	63 mm		
50	α_R	2,5 °	2,5 mm	2,5 °
	$D_{max.}$	98 mm		
	$D_{min.}$	86 mm		
63	α_R	1,5 °	2,5 mm	2,5 °
	$D_{max.}$	124 mm		
	$D_{min.}$	111 mm		
80	α_R	1,3 °	2,5 mm	2,0 °
	$D_{max.}$	158 mm		
	$D_{min.}$	147 mm		
100	α_R	1,1 °	2,5 mm	1,5 °
	$D_{max.}$	198 mm		
	$D_{min.}$	190 mm		
125	α_R	0,9 °	2,5 mm	0,9 °
	$D_{max.}$	248 mm		
	$D_{min.}$	240 mm		
160	α_R	0,6 °	2,5 mm	0,7 °
	$D_{max.}$	318 mm		
	$D_{min.}$	310 mm		

Çıkıntı uzunluğuna bağlı azami devir sayısı n_{max} in min^{-1}			
DC mm	l_a = 2 x Ø mm	l_a = 3 x Ø mm	l_a = 5 x Ø mm
25	26560	19520	13320
32	24160	16720	9520
40	22160	14400	7200
50	20320	12320	4880
63	18640	10320	2960
80	17040	8480	
100	15680	6720	
125	14320		
160	13200		

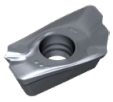
$D_{max.}$ mm = Düz zemin için en büyük çap ölçüsü

$D_{min.}$ mm = düz taban yüzeyi için en küçük delik çapı

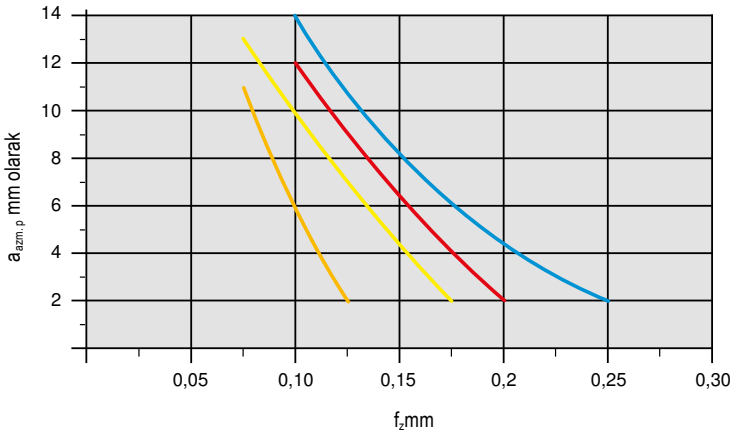
a_p (mm) = D x π x tan (α_R) = Hatve

l_a mm = Tutucudan çıkma miktarı

Başlangıç parametreleri



XDKT 15



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**XDKT150508SR-M50**	**CTCP230**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**XDKT150508SR-F50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**XDKT150508SR-R50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**XDKT150508ER-F40**	**CTC5240**	35	Emülsiyon

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

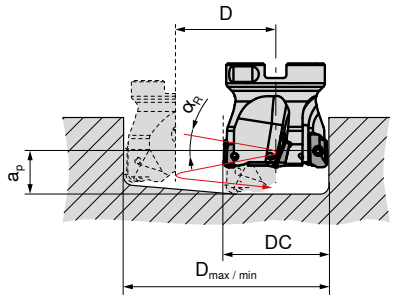
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

Sistem MaxiMill 211-20

İşleme stratejisi

Helisel dalma





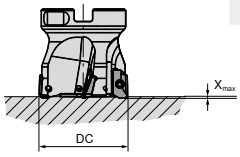
DC mm	D_{max} / RE 0,4 mm	D_{min} mm	$\alpha_{R\,max}$ °
63	124	107	2,2
80	158	143	1,7
100	198	183	1,3

a_p (mm) = D * π * tan α_R

Eksenel dalma



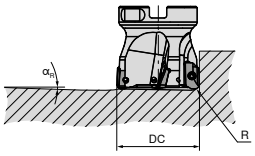
DC mm	X_{max} mm
63	2,0
80	2,0
100	2,0



Açılı frezeleme (Rampa)



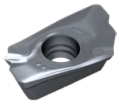
DC mm	α °
63	2,2
80	1,7
100	1,3



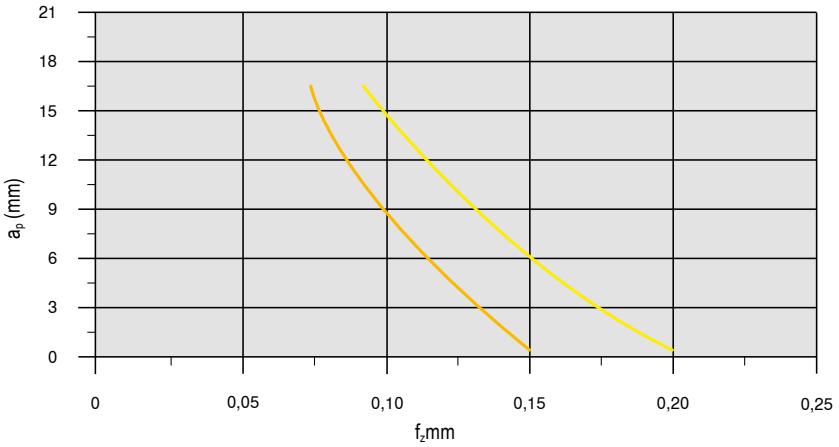
D = D_{max} - DC / D_{min} - DC

$D_{max.}$ mm = Düz zemin için en büyük çap ölçüsü
$D_{min.}$ mm = Düz tabanlı en küçük delik çapı

Başlangıç parametreleri



XDKT 20



Malzeme			Takma Uç		v_c m/min	Soğutma
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**XDKT200708ER-F40**	**CTPM240**	180	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**XDKT200708ER-F40**	**CTC5240**	35	Emülsiyon

15

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

Sistem MaxiMill 490-09

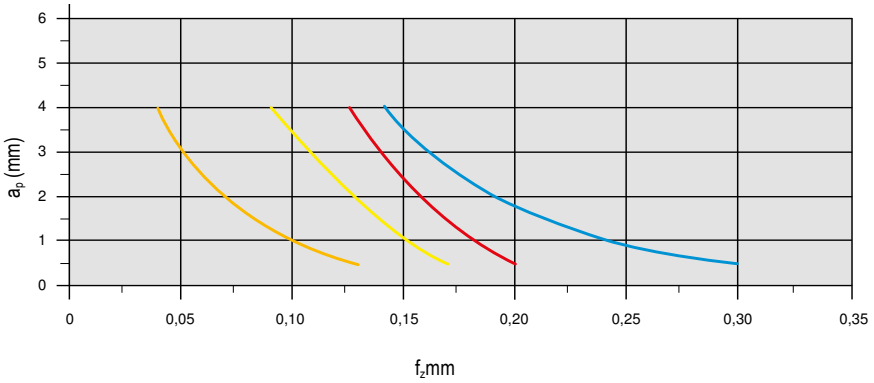
İşleme stratejisi

Sistem MaxiMill 490-09 helisel frezeleme ile delmeye uygun değildir!

Başlangıç parametreleri



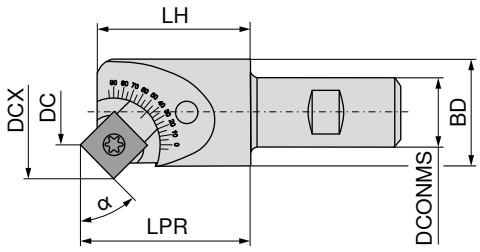
SDNT 09



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**SDNT09T308SR-29**	**CTCP230**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**SDNT09T308SR-33**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**SDNT09T308SR-31**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**SDNT09T308ER-M31**	**CTC5240**	35	Emülsiyon

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

MaxiMill 490-09 açılı frezeler – boyutlar



Sabit boyutlar			Açıya bağlı boyutlar*			
BD	DCONMS	LH	α	DC*	DCX	LPR*
18,6	16	32	**0°**	**9,35/1,60****	**20,14**	**33,07**
			5°	3,81	20,82	33,40
			10°	4,59	21,44	33,69
			15°	**5,42**	**21,98**	**33,95**
			20°	6,30	22,45	34,17
			25°	7,23	22,85	34,35
			30°	**8,18**	**23,16**	**34,49**
			35°	9,15	23,39	34,58
			40°	10,14	23,53	34,64
			45°	**11,13**	**23,59**	**34,65**
			50°	12,12	23,56	34,61
			55°	13,09	23,44	34,54
			60°	**14,04**	**23,24**	**34,42**
			65°	14,96	22,96	34,26
			70°	15,84	22,60	34,06
			75°	**16,68**	**22,16**	**33,83**
			80°	17,46	21,65	33,56
			85°	18,19	21,07	33,25
			90°	**10,07/1,90****	**20,44**	**32,93**

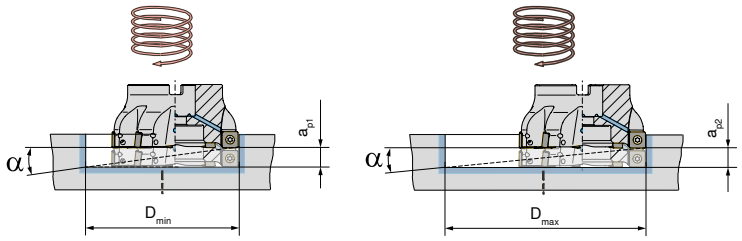
* En derin müdahale noktasında teğetsel kesim noktası
** merkezdeki en küçük çap

Sistem MaxiMill 490-12

İşleme stratejisi

Helisel dalma (pilot delik açmadan)





$$B = (D_W - DC) \times \pi \times \tan \alpha$$

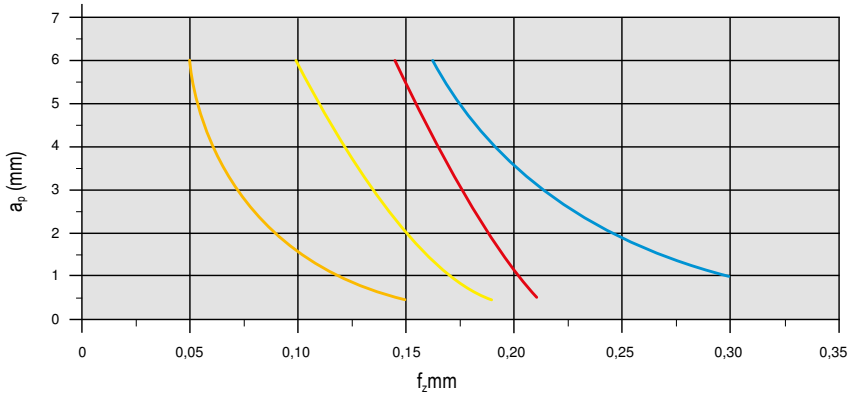
D_w = Açılacak deliğin çapı
DC = Freze takımının anma çapı
B = 360° dairesel harekette eksenel kesme genişliği

DC mm	D_{min} mm	a_{p1} mm	D_{max} mm	a_{p2} mm	α °
50	77	2,5	98	4,8	2,0
63	103	1,8	124	3,0	1,0
80	137	2,1	158	3,0	0,8
100	177	2,1	198	2,9	0,6
125	227	1,8	248	2,4	0,4

Başlangıç parametreleri



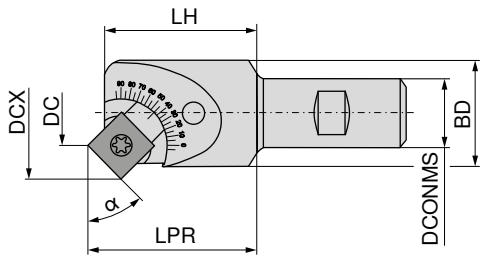
SDMT 12



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**SDMT1205ZZSN-29**	**CTCP230**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**SDMT120512SR-33**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**SDMT1205ZZSN-31**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**SDMT120508ER-M31**	**CTC5240**	35	Emülsiyon

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

MaxiMill 490-12 açılı frezeler – boyutlar



Sabit boyutlar			Açıya bağlı boyutlar*			
BD	DCONMS	LH	α	DC*	DCX	LPR*
25	20	37	**0°**	**25,07/1,12****	**26,64**	**38,36**
			5°	3,72	27,61	38,79
			10°	4,84	28,48	39,21
			15°	**6,03**	**29,25**	**39,58**
			20°	7,27	29,92	39,90
			25°	8,57	30,48	40,16
			30°	**9,91**	**30,92**	**40,37**
			35°	11,28	31,25	40,51
			40°	12,67	31,45	40,60
			45°	**14,08**	**31,54**	**40,62**
			50°	15,48	31,50	40,58
			55°	16,86	31,34	40,48
			60°	**18,23**	**31,06**	**40,33**
			65°	19,56	30,66	40,11
			70°	20,85	30,15	39,83
			75°	**22,08**	**29,52**	**39,51**
			80°	23,26	28,79	39,12
			85°	24,35	27,95	38,69
			90°	**25,37/1,42****	**26,94**	**38,21**

* En derin müdahale noktasında teğetsel kesim noktası
** merkezdeki en küçük çap

HSC (yüksek hızlı)/HPC(yüksek performanslı) işleme

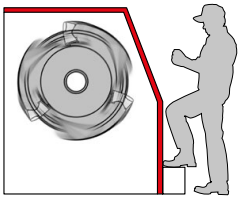
Güvenlik tavsiyesi

Takımın HSC işlemeye uygunluğu

CERATIZIT'in HSC takımları özel olarak bu işleme stratejisi için geliştirilmiş olup, azami işletim emniyetini garanti ederler.

Tezgah üreticisinin güvenlik uyarılarının gözetilmesi

Makine üreticisinin tüm güvenlik uyarılarına uyulmasını (örneğin: kapalı işleme ünitesi) sağlayın.

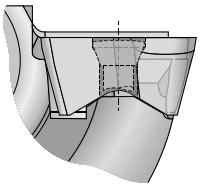


Takım tutucuların HSC işlemeye uygunluğu

Frezeleme durumuna göre optimum takım ve bağlama ünitesi kombinasyonunu seçin.
Yüksek devirli freze uygulamaları için takım ve takım tutucunun birlikte dinamik balansının alınması gerekmektedir (ISO 1940 yönergesine bakınız).

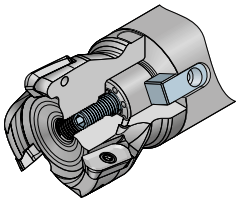
Ucun merkez kaç kuvvete karşı korumalı montajı

Uç sıkıştırma: EURO-Patent EP 1083017A1
Uç yuvasının temizlendiğinden ve sıkıştırma vidası için deliğin üst konumda olduğundan emin olun.
Ucun, yuvasındaki eksenel ve radyal temas noktalarını kontrol edin.
Pozitif ucun sabitlenmesi için sıkıştırma vidası M torku ile sıkılmalıdır
(XDHT11 = 1,8 Nm; XDH.19 = 6,0 Nm).



HSC frezelerinin (DC = Ø 40–63)
freze tutucusuna power tespit vidalarıyla optimum sabitlenmesi

Power vida takım ve freze tutucunun arasında sağlam bir bağlantı kurar, kullanımı kolaydır.



Tesbit vidası

Kabul edilebilir maksimum devir sayısı

Takım üzerinde belirtilen maksimum devir sayısına dikkat edin. Bu sayı sadece ilgili takım için geçerlidir ve seçilen tutucuya, toplam takım boyuna ve işleme durumuna göre ayarlanmalıdır.



Takımın optimal uygulama aralığı (a_e, a_p, f_z, n)

Verimli bir frezeleme için kesme parametreleri ile ilgili önerileri gözetiniz.

Bu emniyet düzenlemelerine uyulmaması CERATIZIT şirketinin sorumluluğunu otomatik olarak ortadan kaldırır

Sistem MaxiMill HSC-11

Kesme değerleri tablosu

İşlenecek Malzeme		İşlem / alaşım		VDI 3323 Grup	Sertlik HB	H216T (CTWN215) v_c m/min	H216T (CTWN215) v_c m/min
N	Aluminyum alaşımları	Sertleştirilemez		21	60		660–9840
		Sertleştirilebilir		22	100		660–6560
	Döküm-alüminyum alaşımı	Sertleştirilemez	< 12% Si	23	80		660–6560
		Sertleştirilebilir	< 12% Si	24	90		660–5900
		Sertleştirilemez	> 12% Si	25	130		660–3280
	Bakır ve bakır alaşımları (Bronz, Pirinç)		Otomat malzemesi (%1 Kurşun)	26			660–1970
			Pirinç, kırmızı bronz	27	90	820–3280	820–3280
			Bronz	28	100		490–1310
			Kurşunsuz bakır ve elektrolitik bakır	29	100		980–2620
O	Metal dışı malzemeler		Duroplastikler	29		260–3280	260–3280
			Fiber güçlendirilmiş plastik	29		230–1640	230–1640
			Sert kauçuk	30		100–260	100–260

= Tam soğutma

= Minumum miktarda yağlama

= Kuru işleme

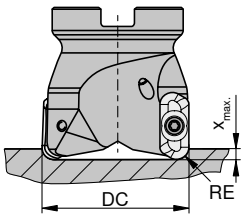
15

Sistem MaxiMill HSC-11

İşleme stratejisi

Eksenel dalma

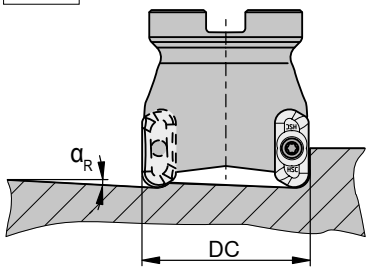




DC mm	11 RE 0,2–4,0 $x_{max.}$ mm
16	1,70
18	2,11
19	2,24
20	2,39
22	2,70
25	2,55
32	2,40
40	2,28
50	2,26
63	2,10
80	1,75
100	1,79

Açılı frezeleme (Rampa)





DC mm	α_R °
16	18,8
18	16,3
19	15,3
20	14,8
22	13,8
25	10,3
32	6,8
40	4,8
50	3,5
63	2,5
80	1,8
100	1,3

Kaba ve finiş operasyon için frezeleme stratejisi

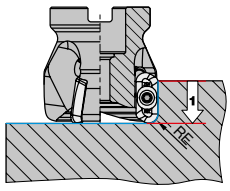
Maksimum talaş hacmi

Kesici uç	RE mm	a_p mm	$a_{p\,max.}$ mm
XDHT 11T302FR-ALP	0,2	10	9,8
XDHT 11T304FR-ALP	0,4	10	9,6
XDHT 11T308FR-ALP	0,8	10	9,2
XDHT 11T312FR-ALP	1,2	10	8,8
XDHT 11T316FR-ALP	1,6	10	8,4
XDHT 11T320FR-ALP	2,0	10	8,0
XDHT 11T325FR-ALP	2,5	10	7,5
XDHT 11T332FR-ALP	3,2	10	6,8
XDHT 11T340FR-ALP	4,0	10	6,0
XDHT 11T350FR-ALP	5,0	10	5,0

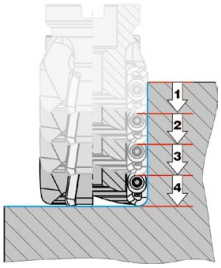
Maksimum yan yüzey kalitesi

Kesici uç	RE mm	$a_{p\,max.}$ mm
XDHT 11T302FR-ALP	0,2	7,8
XDHT 11T304FR-ALP	0,4	7,6
XDHT 11T308FR-ALP	0,8	7,2
XDHT 11T312FR-ALP	1,2	6,5
XDHT 11T316FR-ALP	1,6	6,8
XDHT 11T320FR-ALP	2,0	6,4
XDHT 11T325FR-ALP	2,5	5,5
XDHT 11T332FR-ALP	3,2	4,8
XDHT 11T340FR-ALP	4,0	4,0
XDHT 11T350FR-ALP	5,0	3,0

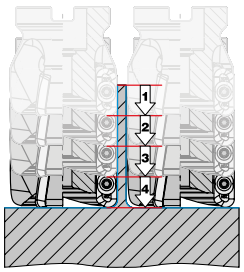
Köşe frezeleme



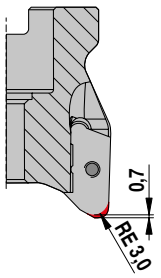
Cep frezeleme

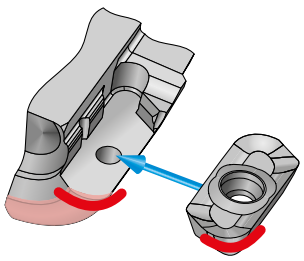


İnce duvarlı parçalarda cep frezeleme



Ön profilde modifikasyon



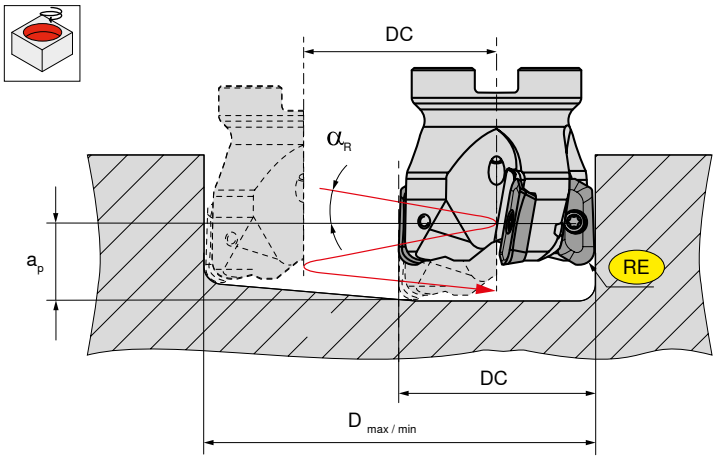


Köşe radyusu 3,2 mm den daha büyük uçlar için freze gövdesi yukarıdaki resime göre modifiye edilmelidir.

Sistem MaxiMill HSC-11

İşleme stratejisi

Helisel dalma



RE = Uç radyusu
α_R mm = Maksimum rampa açısı (takım merkezine göre)

a_p (mm) = Hatve → D x π x tan (α_R)

D mm = → D_{maks} – DC ve/veya D_{min} – DC

Düz delik zemini için

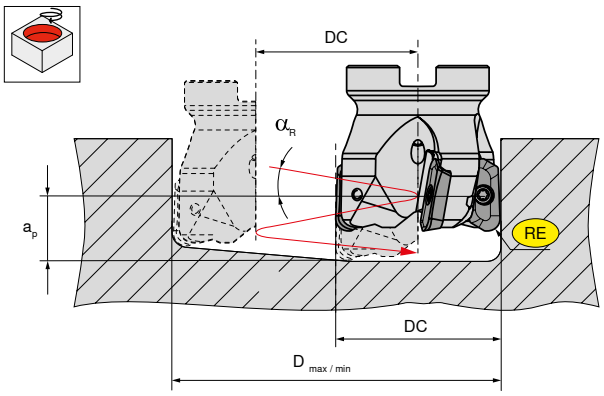
$D_{max.}$ mm = En büyük delme çapı
$D_{min.}$ mm = En küçük delme çapı
$DN_{max.}$ mm = Düz olmayan delik zemini için maksimum delik çapı!

DC mm		XDHT-11 (HSC-11)								
(DN_{max})		RE = 0,2	RE = 0,4	RE = 0,8	RE = 1,2	RE = 1,6	RE = 2,0	RE = 2,5	RE = 3,2	RE = 4,0
16	α_R	9,7°	10,0°	9,9°	9,4°	8,9°	8,4°	7,9°	7,0°	6,1°
	$D_{max.}$	30	30	29	28	27	27	26	24	23
(31)	$D_{min.}$	18	18	18	18	18	18	18	18	18
18	α_R	9,4°	9,1°	8,7°	8,3°	7,9°	7,5°	6,9°	6,2°	5,3°
	$D_{max.}$	34	34	33	32	31	31	30	28	27
(35)	$D_{min.}$	22	22	22	22	22	22	22	22	22
19	α_R	8,8°	8,6°	8,3°	7,9°	7,5°	7,5°	6,5°	5,9°	5,1°
	$D_{max.}$	36	36	35	34	33	33	32	30	29
(37)	$D_{min.}$	24	24	24	24	24	24	24	24	24
20	α_R	8,4°	8,2°	7,8°	7,4°	7,7°	6,7°	6,2°	5,5°	4,8°
	$D_{max.}$	38	38	37	36	35	35	34	32	31
(39)	$D_{min.}$	26	26	26	26	26	26	26	26	26
22	α_R	7,6°	7,4°	7,8°	6,7°	6,4°	6,5°	5,6°	5,2°	4,3°
	$D_{max.}$	42	42	41	40	39	39	38	36	35
(43)	$D_{min.}$	30	30	30	30	30	30	30	30	30
25	α_R	6,7°	6,5°	6,2°	5,9°	5,6°	5,3°	4,9°	4,4°	3,8°
	$D_{max.}$	48	48	47	46	45	45	44	42	41
(49)	$D_{min.}$	36	36	36	36	36	36	36	36	36
32	α_R	4,7°	4,7°	4,8°	4,6°	4,3°	4,1°	3,8°	3,4°	2,9°
	$D_{max.}$	62	62	61	60	59	59	58	56	55
(63)	$D_{min.}$	50	50	50	50	50	50	50	50	50
40	α_R	3,3°	3,3°	3,4°	3,4°	3,5°	3,3°	3,0°	2,7°	2,3°
	$D_{max.}$	78	78	77	76	75	75	74	72	71
(79)	$D_{min.}$	66	66	66	66	66	66	66	66	66
50	α_R	2,4°	2,5°	2,5°	2,5°	2,6°	2,6°	2,4°	2,2°	1,9°
	$D_{max.}$	98	98	97	96	95	95	94	92	91
(99)	$D_{min.}$	86	86	86	86	86	86	86	86	86
63	α_R	1,7°	1,7°	1,7°	1,8°	1,8°	1,8°	1,8°	1,7°	1,5°
	$D_{max.}$	124	124	123	122	121	121	120	118	117
(125)	$D_{min.}$	112	112	112	112	112	112	112	112	112
80	α_R	1,1°	1,1°	1,1°	1,1°	1,1°	1,1°	1,1°	1,2°	1,2°
	$D_{max.}$	158	158	157	156	155	155	154	152	151
(159)	$D_{min.}$	146	146	146	146	146	146	146	146	146
100	α_R	0,8°	0,8°	0,9°	0,9°	0,9°	0,9°	0,9°	0,9°	0,9°
	D_{max}	198	198	197	196	195	195	194	192	191
(199)	$D_{min.}$	186	186	186	186	186	186	186	186	186

Sistem MaxiMill HSC/HPC-19

İşleme stratejisi

Helisel dalma



RE = Uç radyusu
α_R mm = Maksimum rampa açısı (takım merkezine göre)

a_p (mm) = Hatve → D x π x tan (α_R)

D mm = → D_{maks} – DC ve/veya D_{min} – DC

Düz delik zemini için

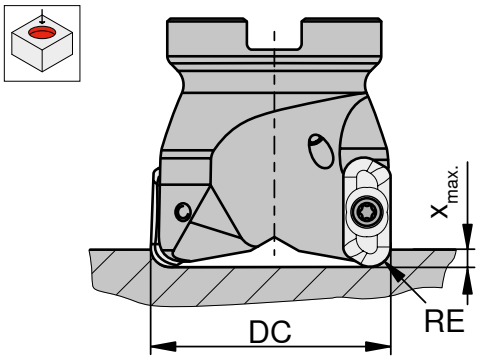
$D_{max.}$ mm = En büyük delme çapı
$D_{min.}$ mm = En küçük delme çapı
$DN_{max.}$ mm = Düz olmayan delik zemini için maksimum delik çapı!

	DC mm	DN_{max} mm	α_R °	D_{max} mm	D_{min} mm
RE = 0,2 mm	**25**	49	7°02‘	48	32
	32	63	4°34‘	62	46
	40	79	3°47‘	78	62
	50	99	3°01‘	97	81
	63	125	2°17‘	124	107
	80	159		158	141
	100	199		198	181
RE = 0,4 mm	**25**	49	7°08‘	48	32
	32	63	4°37‘	62	46
	40	79	3°49‘	78	62
	50	99	3°02‘	98	81
	63	125	2°18‘	124	107
	80	159		158	141
	100	199		198	181
RE = 0,8 mm	**25**	49	7°21‘	47	32
	32	63	4°44‘	61	46
	40	79	3°53‘	77	62
	50	99	3°05‘	97	81
	63	125	2°20‘	123	107
	80	159		157	141
	100	199		197	181
RE = 2,0 mm	**25**	49	8°40‘	45	32
	32	63	5°04‘	59	46
	40	79	4°06‘	75	62
	50	99	3°13‘	95	81
	63	125	2°25‘	121	107
	80	159		155	141
	100	199		195	181
RE = 2,5 mm	**25**	49	8°24‘	44	32
	32	63	5°13‘	58	46
	40	79	4°12‘	74	62
	50	99	3°17‘	94	81
	63	125	2°27‘	120	107
	80	159		154	141
	100	199		194	181
RE = 3,2 mm	**25**	49	8°54‘	42	32
	32	63	5°26‘	56	46
	40	79	4°20‘	72	62
	50	99	3°21‘	92	81
	63	125	2°30‘	118	107
	80	159		152	141
	100	199		192	181
RE = 4,0 mm	**25**	49	9°32‘	41	32
	32	63	5°42‘	55	46
	40	79	4°30‘	71	62
	50	99	3°28‘	91	81
	63	125	2°33‘	117	107
	80	159		151	141
	100	199		191	181
RE = 5,0 mm	**25**	49	6°49‘	39	32
	32	63	3°59‘	53	46
	40	79	3°20‘	69	62
	50	99	2°13‘	89	81
	63	125	1°52‘	115	107
	80	159		149	141
	100	199		189	181

Sistem MaxiMill HSC/HPC-19

İşleme stratejisi

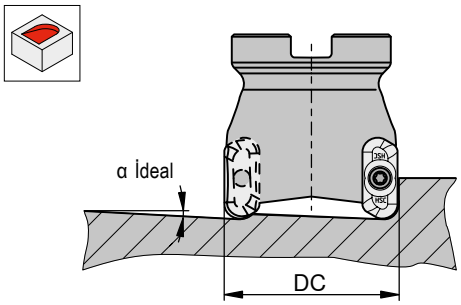
Eksenel dalma



HSC 19	DC mm	19 RE 0,2–4,0 $x_{max.}$ mm	19 RE 5,0 $x_{max.}$ mm
CHSC 19 / GHSC 19 / MHSC 19	25	5,0	4,0
CHSC 19 / GHSC 19 / MHSC 19	32–40	4,0	3,0
AHSC 19	40–100	4,0	3,0

HPC 19	DC mm	19 RE 0,2–4,0 $x_{max.}$ mm	19 RE 5,0 $x_{max.}$ mm
CHPC 19 / MHPC 19	22–25	5,0	4,0
CHPC 19 / MHPC 19	32–50	6,0	5,0
AHPC 19	40–63	6,0	5,0

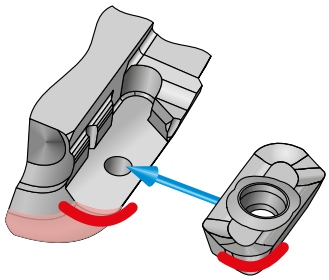
Açılı frezeleme (Rampa)

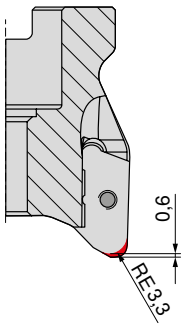


DC mm	α İdeal HSC 19	α İdeal HPC 19
25	11°	11°
32	7°	7°
40	5°	5°
50	4°	4°
63	3°	3°
80	2°	
100	2°	

Gövdede modifikasyon

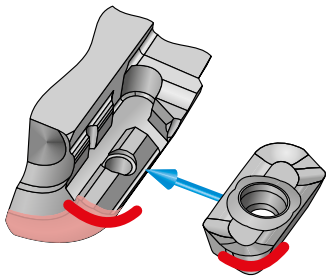
HSC 19





Ön profilde modifikasyon

HPC 19

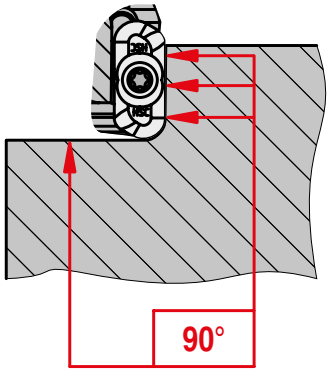


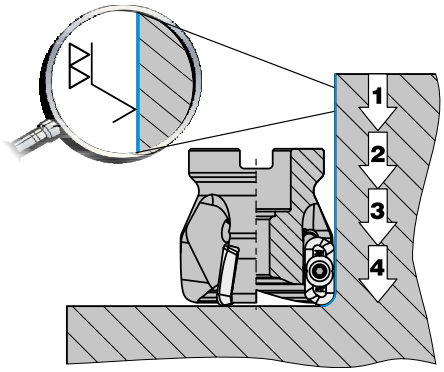
Köşe radyusu 4,0 mm den daha büyük uçlar için freze gövdesi yukarıdaki resime göre modifiye edilmelidir.

Sistem MaxiMill HSC/HPC-19

İşleme stratejisi

Kaba talaş kaldırma işleminden sonra mükemmel yan yüzey kalitesi.
Ek finiş frezeleme işlemi gerekmez.





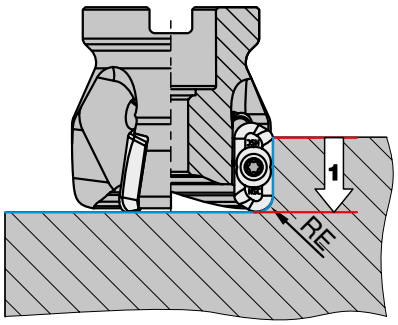
Maksimum talaş hacmi

Kesici uç	RE mm	a_p mm	$a_{p\ max.}$ mm
XDH. 190402FR-ALP	0,2	18,0	17,8
XDH. 190404FR-ALP	0,4	18,0	17,6
XDH. 190408FR-ALP	0,8	18,0	17,2
XDH. 190420FR-ALP	2,0	18,0	16,0
XDH. 190425FR-ALP	2,5	18,0	15,0
XDH. 190432FR-ALP	3,2	18,0	14,8
XDH. 190440FR-ALP	4,0	18,0	14,0
XDH. 190450FR-ALP	5,0	17,0	13,0

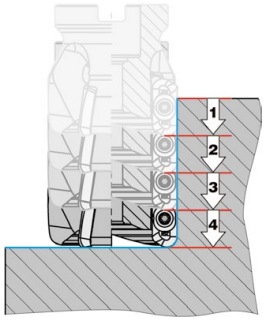
Maksimum yan yüzey kalitesi

Kesici uç	RE mm	$a_{p\ max.}$ mm
XDH. 190402FR-ALP	0,2	11,8
XDH. 190404FR-ALP	0,4	11,6
XDH. 190408FR-ALP	0,8	11,2
XDH. 190420FR-ALP	2,0	10,0
XDH. 190425FR-ALP	2,5	9,5
XDH. 190432FR-ALP	3,2	8,8
XDH. 190440FR-ALP	4,0	8,0
XDH. 190450FR-ALP	5,0	7,0

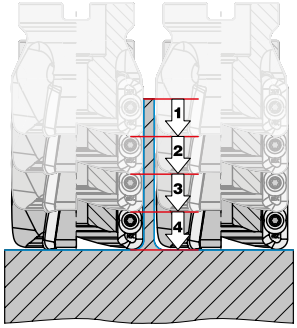
Köşe frezeleme



Cep frezeleme



İnce duvarlı parçalarda cep frezeleme



Bu bilgiler sadece XDHT 19 ve XDHX 19 uç tipleri için geçerlidir.

Sistem MaxiMill HPC-04/12

İşleme stratejisi

Nelere dikkat edilmelidir?

- ▲ Tezgah stabilitesine.
- ▲ Stabil iş parçası ve takım tutucu bağlantısına.
- ▲ Soğutma sıvısı kullanmak genelde zorunlu değildir. Ancak kullanmak, talaş tahliyesini kolaylaştırır ve daha iyi bir yüzey kalitesi elde edilmesi sağlar.
- ▲ Sıcaklık değişim etkilerini ve kritik sıcaklık sınırı 600°C'yi dikkate alarak malzemeye göre soğutma sıvısı ile çalışmaya.
- ▲ Titreşimlerden kaçınmaya.
- ▲ Balans kalitesine.
- ▲ Elmas ve karbür elementlerinin kimyasal reaksiyonlarına (Fe, Ti, Ta, Co, Ni).

Uygulama ne zaman gereklidir?

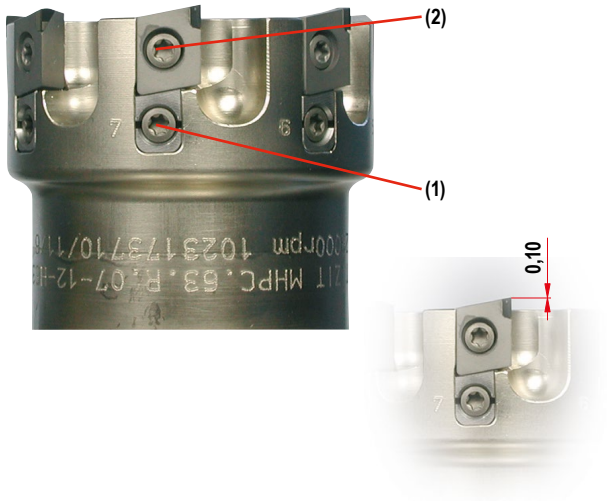
- ▲ Grafit, fiber, plastik, demir dışı metaller ve hafif metallerden yapılmış parçalar için
- ▲ Basit ayarlama imkanları sayesinde takım ön ayar zamanlarından tasarruf edileceği zaman.
- ▲ Seri imalat için.
- ▲ İyi yüzey kalitesi beklenen iş parçaları için.
- ▲ Tezgahların pahalı atıl sürelerini ve takım değiştirme sürelerini azaltmak için uzun takım ömrü gerekli olduğu zamanlarda.
- ▲ Yerinde yapılması gereken bakım, ön ayar v.s. gibi zamanlarda

Balans değerinin kontrol edilmesi

Uçların montajından ve eksenel sapmanın ayarlanmasından sonra, takımın balans kalite sınıfı kontrol edilmelidir. Freze kafası uygulamasında, tutucu ile monte edildikten sonra balansının alınması gereklidir.

Silicili uç ile ayarlama

Yukarıda tarif edilen biçimde hareket edilerek,standart uçlar, radyal salgı 0,02 mm olacak şekilde ayarlanır. Bundan sonra silici uçlar, en yüksek konumda olan ucun 0,02–0,03 mm üzerinde ayarlanacaktır.



Ayar işlemi

1 Ayarlı baskı parçalarını gövdeye takın, ayarlı parçaları bozmaksızın vidayı sıkın (1)

2 PCD uçları monte edin ve vidaları (2) 1,0 Nm ile sıkıştırın.

3 Bir ön ayar cihazı ile "en yüksek kesme kenarının" işaretlenmesi.

4 PCD ucun ayarının 0,02 mm değiştirilmesi, ayar vidasının (1) saat yönünde döndürülmesi ile

Ön sıkma işleminin yapılmış olması gereklidir, bunun için birlikte teslim edilen tork tornavidayı kullanınız.

5 Diğer uçların da bu seviyeye göre maksimum olarak 0,005 mm sapma payı ile ayarlanmaları. Maksimum ayar mesafesi = 0,10 mm

6 Tüm uç sıkma vidalarını sıkın (2), tork momenti 5,0 Nm.

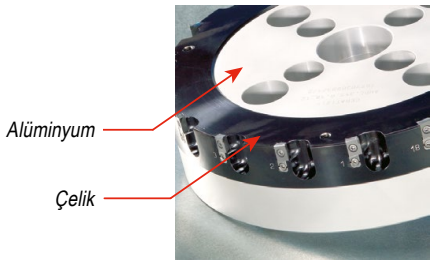
7 Tüm uçların eksenel sapma kontrolü: Hedef = 0,005 mm.

Mükemmel hassasiyet – MaxiMill HPC-12

Alüminyum parçaların finiş işlenmesi için yüksek performanslı ayarlanabilir freze

Takım gövdesi çelikten imal edilmiştir

- ▲ En yüksek stabilite için
- ▲ Maksimum aşınma direnci
- ▲ 160 mm ve daha büyük çaptaki takımlar Bi-Metal yapıda olup, taşıma kolaylığı ve iş mili açısından daha uygundur.



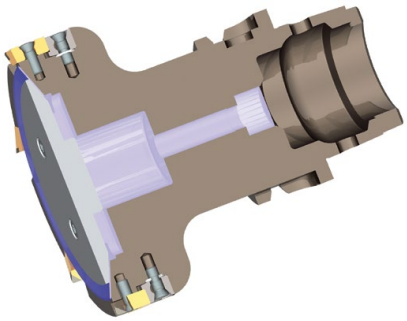
Bi-Metal tip görülmektedir

Delikli tip veya monoblok olarak mevcuttur

- ▲ Monoblok tip olarak HSK 63-A bağlantı
- ▲ Monoblok takım balansı G2,5, n = 20.000 dak.$^{-1}$ (ISO1940)

Özellikle HSC uygulamalar için içten soğutma sıvısı delikli

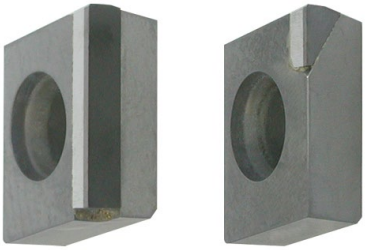
- ▲ Geliştirilmiş talaş tahliyesi
- ▲ Çok iyi yüzey kalitesi
- ▲ Optimum uygulama şartları
- ▲ Minimum miktarda yağlamaya uygun



Vakit nakittir! – Sistem MaxiMill HPC-12 kolay ve hızlı şekilde ayarlanır!

Yüksek pozitif kesme açısı +25°

- ▲ Düşük kesme kuvvetleri
- ▲ Yüzeylerin paralelliğinin artırılması
- ▲ Minimum düzeyde iş parçası deformasyonu



Tanjantiyal sistem

- ▲ PCD segmenti için stabil yerleştirme ve maksimum proses güvenliği

Uyarlanmış PCD-kesme kenarı

- ▲ Yüksek darbeye dayanıklı frezeleme!
- ▲ Maksimum kenar mukavemeti
- ▲ İş parçası yüzeyinde minimize edilmiş talaş sıvanması
- ▲ %12'den fazla Silisyum içeren Al-Si Alaşımlarının işlenmesi problemsiz olarak gerçekleştirilir.

Uçlarda seçim

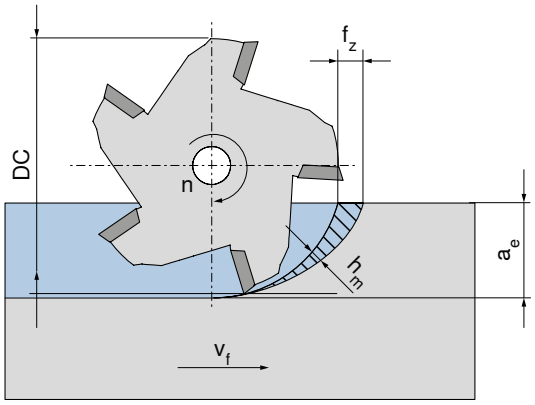
- ▲ Standart uç
- ▲ Köşe radyuslu uç
- ▲ Silici kenarlı uç

Ortalama talaş kalınlığı [h_m] – Kural

Köşe frezeleme

1 Tablodan çelik malzemeler için uygun ortalama talaş kalınlığı [h_m] değerini seçin.

Malzeme	Çekme mukavemeti N/mm²	h_m mm
Çelik için	...–800	0,16
Çelik için	800–1000	0,14
Çelik için	1000–1200	0,12
Çelik için	1200–...	0,10
Paslanmaz çelik için	...–750	0,15
Paslanmaz çelik için	750–900	0,13
Paslanmaz çelik için	900–1150	0,11
Paslanmaz çelik için	1150–...	0,09 *

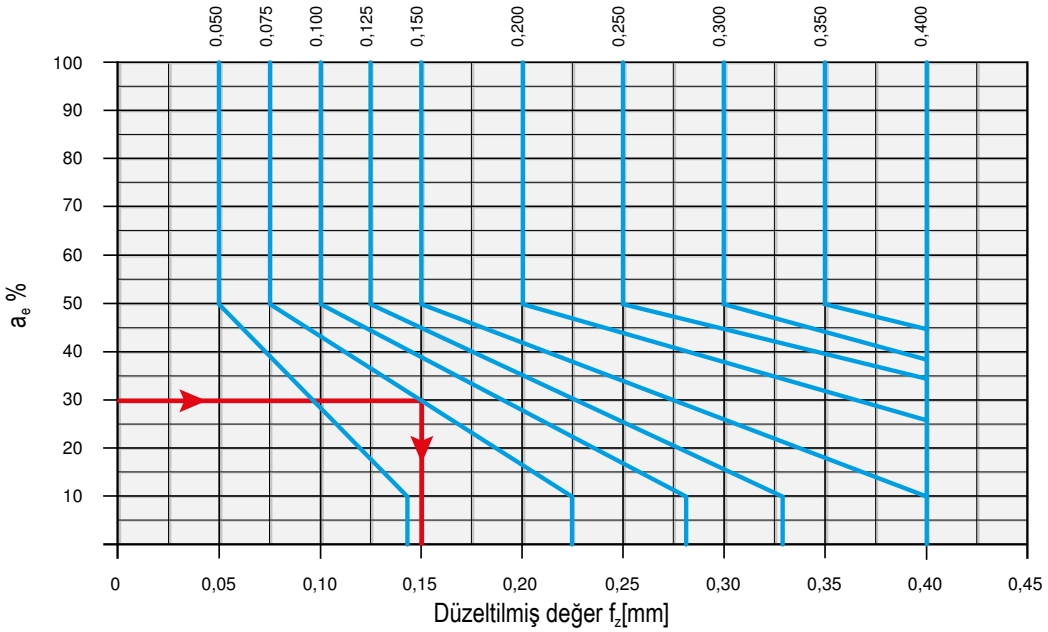


2 Tablodan uygun talaş kalınlığı (h_m) ve kesme derinliği (a_e) değerlerine uyan ilerlemeyi seçin.

h_m mm	h_m için düzeltilmiş ilerleme f_z değeri				
0,16	0,36	0,29	0,25	0,18	0,16
0,14	0,31	0,26	0,22	0,16	0,14
0,12	0,27	0,22	0,19	0,14	0,12
0,10	0,22	0,18	0,16	0,12	0,10
0,15	0,34	0,27	0,24	0,17	0,15
0,13	0,29	0,24	0,21	0,15	0,13
0,11	0,25	0,20	0,17	0,13	0,11
0,09 *	0,20	0,16	0,14	0,10	0,09 *
a_e =	**0,2 x DC**	**0,3 x DC**	**0,4 x DC**	**0,75 x DC**	**1 x DC**

* f_z < 0,08 mm: Takım kesme yapmıyor sayıldığından dolayı tehlikelidir

Başlangıç değerleri tablosundan gelen f_z[mm] değeri



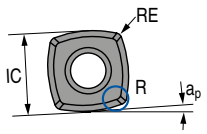
Örnek:
Başlangıç değerleri (f_z) = 0,075 mm
a_e = 30 %
Düzeltilmiş değer (f_z) = 0,15 mm

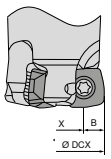
15

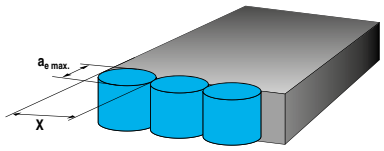
Sistem MaxiMill HFC-06

İşleme stratejisi

Programlama Radyüsü R = 1,2 mm







Kesme derinliği ve geriye kalan malzeme			Düz yüzeyler için kesme genişliği			Dalma frezelemede kesme derinliği				
IC mm	RE mm	$a_{p\ max.}$ mm	DCX mm	X mm	B mm	$a_{e\ max.}$ mm	$f_z$mm			X
							İlk	min.	maks.	
6,35	0,5	0,8	16–32	DCX–(2 x B)	4,3	5,3	0,10	0,08	0,15	<0,7 x DCX

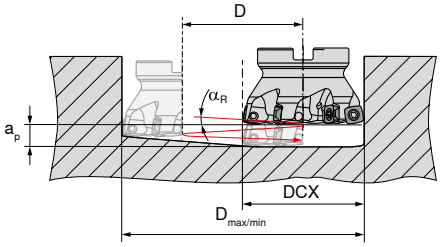


	Dairesel		
	Helisel frezeleme ile delme (dolu malzemede helisel yolla delme)		
DCX mm	$D_{min.}$ mm	$D_{max.}$ mm	$\alpha_{R\ max.}$ °
16	22	31	4,5°
20	30	39	2,3°
25	40	49	1,3°
32	54	63	0,9°
42	74	83	0,6°





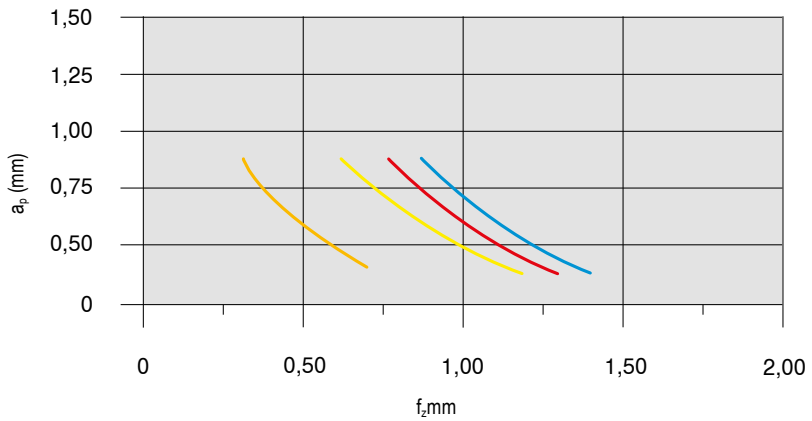
	Eksenel	Açılı
	Dalma frezeleme	
DCX mm	$X_{max.}$ mm	$\alpha_{R\ max.}$ °
16		5,9°
20		3,2°
25	0,5	2°
32		1,3°
42		0,7°



Başlangıç parametreleri



XPLX 06



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**XPLX 060305SR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**XPLX 060305ER-M50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**XPLX 060305ER-M50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**XPLX 060305SR-F40**	**CTC5240**	35	Emülsiyon

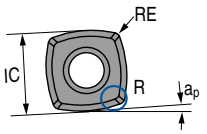
Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

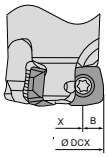
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

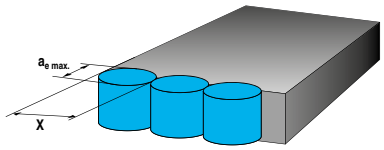
Sistem MaxiMill HFC-09

İşleme stratejisi

Programlanan radyus R = 2 mm







Kesme derinliği ve geriye kalan malzeme			Düz yüzeyler için kesme genişliği			Dalma frezelemede kesme derinliği				
IC mm	RE mm	$a_{p\ max.}$ mm	DCX mm	X mm	B mm	$a_{e\ max.}$ mm	$f_z$mm			X
							İlk	min.	maks.	
9	0,8	1	25–66	DCX–(2 x B)	5,9	7,5	0,10	0,08	0,15	<0,7 x DCX

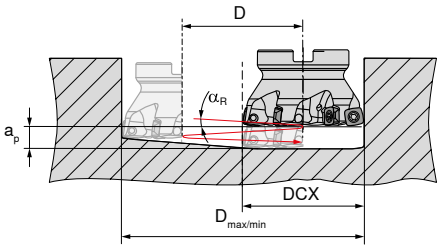


DCX mm	Dairesel: Helisel frezeleme ile delme (dolu malzemede helisel yolla delme) $D_{min.}$ mm	$D_{max.}$ mm	$\alpha_{R\ max.}$ °
25	35	48	3,1°
32	49	62	1,7°
35	55	68	1,4°
40	65	78	1,0°
42	69	82	0,9°
50	85	98	0,8°
52	89	102	0,7°
63	111	124	0,7°
66	117	130	0,6°





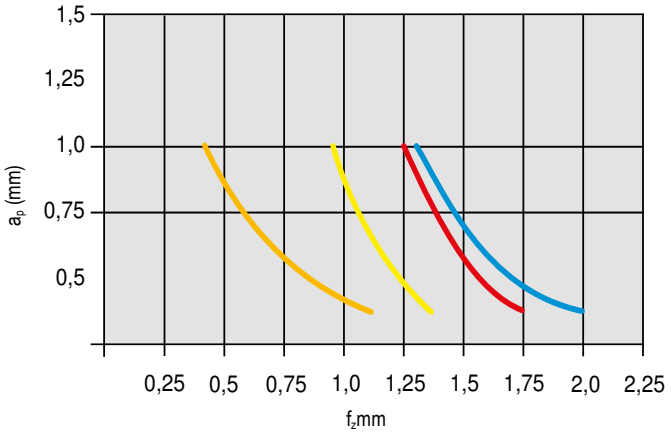
DCX mm	Eksenel: Dalma frezeleme $X_{max.}$ mm	Açılı: Dalma frezeleme $\alpha_{R\ max.}$ °
25		3,6°
32		2,0°
35		1,6°
40		1,2°
42	0,75	1,1°
50		0,9°
52		0,8°
63		0,8°
66		0,7°



Başlangıç parametreleri



XDLX 09



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**XDLX09T308SR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**XDLX09T308SR-M50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**XDLX09T308SR-M50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**XDLX09T308ER-F40**	**CTC5240**	35	Emülsiyon

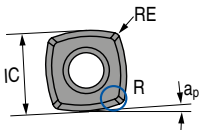
Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

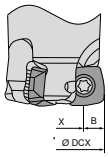
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

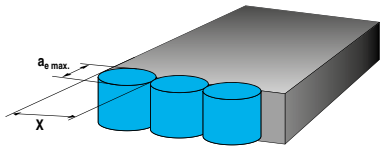
Sistem MaxiMill HFC-12

İşleme stratejisi

Programlanan radyus R = 3 mm







Kesme derinliği ve geriye kalan malzeme			Düz yüzeyler için kesme genişliği			Dalma frezelemede kesme derinliği				
IC mm	RE mm	$a_{p\ max.}$ mm	DCX mm	X mm	B mm	$a_{e\ max.}$ mm	$f_z$mm			X
							İlk	min.	maks.	
12	1,0	2	32–100	DCX–(2 x B)	8,3	10	0,15	0,10	0,20	<0,7 x DCX

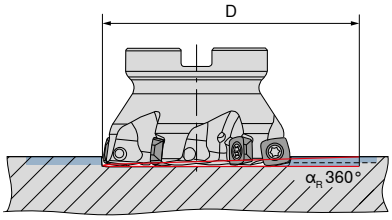


	Dairesel		
	Helisel frezeleme ile delme (dolu malzemede helisel yolla delme)		
DCX mm	$D_{min.}$ mm	$D_{max.}$ mm	$\alpha_{R\ max.}$ °
32	44	62	6,1°
35	50	68	3,7°
40	60	78	2,5°
42	64	82	2,3°
50	80	98	1,3°
52	84	102	1,3°
63	106	124	0,9°
66	112	130	0,9°
80	140	158	1,1°
100	180	198	0,6°





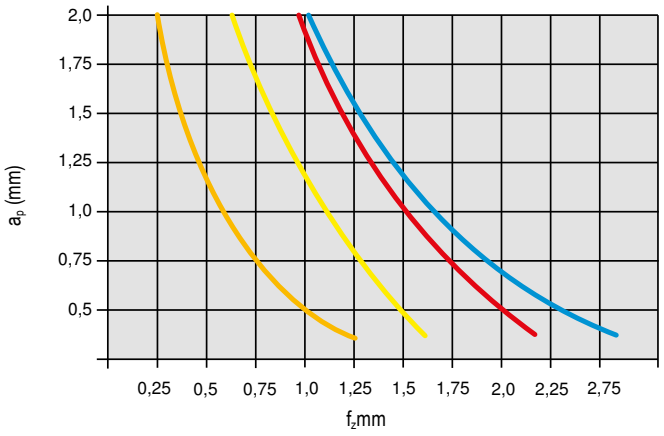
	Eksenel	Açılı
	Dalma frezeleme	
DCX mm	$X_{max.}$ mm	$\alpha_{R\ max.}$ °
32	1,15	7,2°
35		4,4°
40		2,9°
42		2,7°
50 + 52		1,5°
63 + 66		1,1°
80		1,3°
100		0,7°



Başlangıç parametreleri



XOLX 12



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**XOLX120410SR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**XOLX120410ER-M50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**XOLX120410ER-M50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**XOLX120410ER-F40**	**CTC5240**	35	Emülsiyon

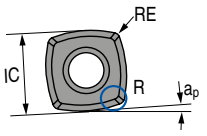
Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

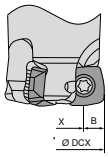
Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

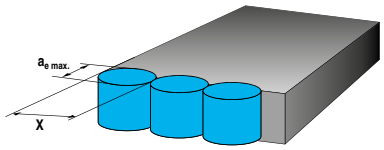
Sistem MaxiMill HFC-19

İşleme stratejisi

Programlanmış yarıçap R = 5 mm







Kesme derinliği ve geriye kalan malzeme			Düz yüzeyler için kesme genişliği			Dalma frezelemede kesme derinliği				
IC mm	RE mm	$a_{p\,max.}$ mm	DCX mm	X mm	B mm	$a_{e\,max.}$ mm	$f_z$mm			X
							İlk	min.	maks.	
19,14	1,5	3,3	63–160	DCX–(2 x B)	13,1	12	0,2	0,10	0,25	<0,65 x DCX

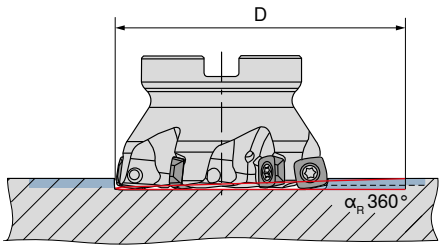


DCX	Dairesel		
	Helisel frezeleme ile delme (dolu malzemede helisel yolla delme)		
	$D_{min.}$	$D_{max.}$	$\alpha_{R\,max.}$
mm	mm	mm	°
63	97	123	2,5°
80	131	157	1,4°
100	171	197	1,0°
125	221	247	0,7°
160	291	317	0,5°





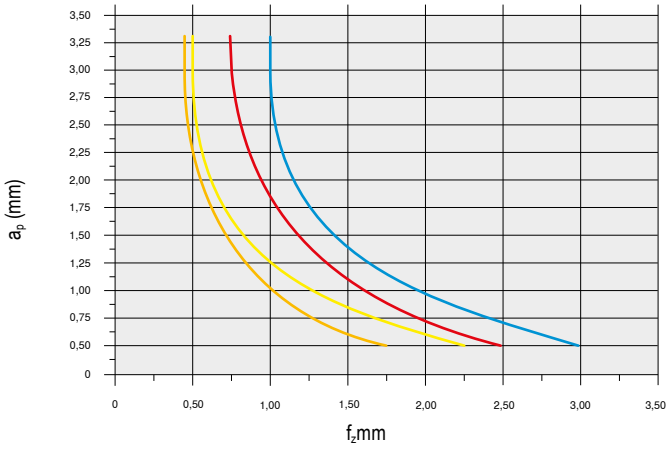
DCX	Eksenel	Açılı	
	Dalma frezeleme		
	$X_{max.}$	$\alpha_{R\,max.}$	$a_{p\,max}$
mm	mm	°	mm
63		2,9°	
80		1,8°	
100	1,7	1,3°	3,3
125		1,0°	
160		0,7°	



Başlangıç parametreleri



XOLX 19



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**XOLX190615SR-M50**	**CTPP235**	200	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**XOLX190615SR-M50**	**CTPM240**	180	Kuru
Dökme demir	**K.1.1**	EN-GJL-250 (GG25)	**XOLX190615SR-M50**	**CTCK215**	250	Kuru
Isıya dayanıklı alaşımlar	**S.2.2**	Inconel 718	**XOLX190615ER-F40**	**CTC5240**	35	Emülsiyon

15

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

Sistem MaxiMill DHFC

Kesme değerleri tablosu

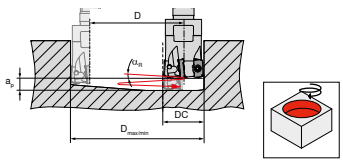
Standart uçlar için

	F			M			R		
Malzeme	v_c m/dak	f_z mm	a_p mm	v_c m/dak	f_z mm	a_p mm	v_c m/dak	f_z mm	a_p mm
Çelik	130–300	0,25–1,0	0,7	130–300	0,25–1,0	0,75			
Paslanmaz çelik				90–210	0,25–1,0	0,60			
Dökme demir				120–270	0,2–1,1	0,70	120–270	0,2–1,2	0,75
Demir dışı metaller									
Isıya dayanıklı alaşımlar				40–80	0,15–0,75	0,6			
Sertleştirilmiş malzemeler									
Metal dışı malzemeler									

İşleme stratejisi

Programlama radyüsü R = 1,4 mm

Helisel dalma



DC mm	D_{min} mm	D_{max} mm	α°
16	23	31	2,5
20	31	39	1,9
25	41	49	1,5
32	55	63	1,2
35	61	69	1,0
42	75	83	0,9

Dolu malzemeye eksenel giriş



DC mm	X_{max} mm
16	0,35
20	0,40
25	0,45
32–35	0,50
40	0,55

Açılı frezeleme (Rampa)



DC mm	α°	y mm
16	<2,5	7
20	<1,9	11
25	<1,5	16
32	<1,2	23
35	<1,0	26
42	<0,9	33

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

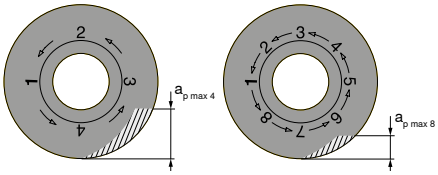
Sistem MaxiMill 251 / 251 RS

Teknik değerler

tavsiye edilen kesme derinliği

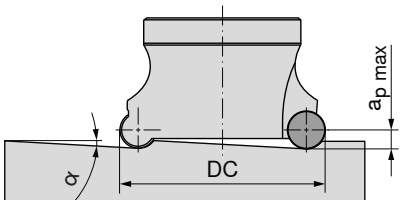
Ø mm	4-yüzlü $a_{p\,max.}$ mm	4-yüzlü $a_{p\,max}$ teoratik mm	8-kez çev. $a_{p\,max.}$ mm
5	1,0	2,0	0,7
8	1,5	3,5	1,1
10	2,5	4,5	1,4
12	3,0	5,5	1,7
16	4,0	7,5	2,3
20	4,0	9,5	2,9

Uçların 4-/8-kez çevrilerek kullanılması halinde kesme derinlikleri



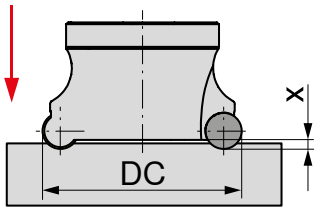
Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

Açılı frezeleme (Rampa)



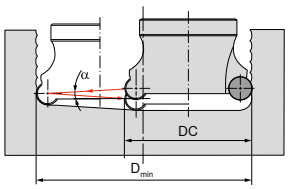
Ø DC mm	05 α °	08 α °	10 α °	12 α °	16 α °	20 α °
10	3,4					
12	16,0					
16	8,0	5,0				
20	5,5	20,0	1,3			
25	4,0	13,0	2,0	6,0		
32	3,0	8,0	3,0	4,0		
40			3,3	2,8		
42			3,1			
50			2,4	2,6	4,0	
52			2,2	2,3		
63				1,9	2,8	
66				1,6		
80				1,3	2,0	3,2
100				1,0	1,5	2,3
125						1,7

Eksenel dalma

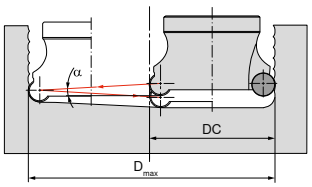


Ø DC mm	05 $X_{max.}$ mm	08 $X_{max.}$ mm	10 $X_{max.}$ mm	12 $X_{max.}$ mm	16 $X_{max.}$ mm	20 $X_{max.}$ mm
10	0,5					
12	1,3					
16	1,3	0,5				
20	1,3	2,7	0,2			
25	1,3	2,7	0,4	1,0		
32	1,3	2,7	0,8	1,1		
40			1,5	1,2		
42			1,5	1,5		
50			1,5	1,5	2,0	
52			1,5	1,5	2,0	
63				1,5	2,0	
66				1,5	2,0	
80				1,5	2,0	3,0
100				1,5	2,0	3,0
125						3,0

Helisel dalma



$D_{min.}$ = Takım çapına bağlı olarak En küçük delme çapı



$D_{maks.}$ = Takım çapına bağlı olarak En büyük delme çapı

Mümkün olan en büyük delik çapı = 2 x DC – 1 mm

Ø DC mm	05 D_{min} mm	05 D_{max} mm	05 α_R °	08 D_{min} mm	08 D_{max} mm	08 α_R °	10 D_{min} mm	10 D_{max} mm	10 α_R °	12 D_{min} mm	12 D_{max} mm	12 α_R °	16 D_{min} mm	16 D_{max} mm	16 α_R °	20 D_{min} mm	20 D_{max} mm	20 α_R °
10	12	15	2,5															
12	16	19	2,1															
16	24	27	1,5	21	24	2,4												
20	32	35	1,2	27	32	1,9	26	30	1,3									
25	42	45	1,0	37	42	1,5	37	40	1,8	31	38	2,2						
32	56	59	0,7	51	56	1,2	50	54	1,5	46	52	1,7						
40							64	70	1,1	62	68	1,4						
42							68	74	1,1									
50							84	90	0,9	81	88	1,1	75	84	1,5			
52							88	94	0,9	86	92	1,0						
63										107	114	0,9	101	110	1,1			
66										113	120	0,8						
80										142	148	0,7	135	144	0,9	128	140	1,1
100										181	188	0,5	175	184	0,7	168	180	0,9
125																218	230	0,7

Sistem R100.

Kesme değerleri tablosu

İçindekiler	WTN1205	WTN1205	WAN2225	WAN2225	WAN1240	WAN1240	WAX1240	WAX1240	WUN4210	WUN4210
	v_c (m/dak)									
P.1.1	275	150			300	180	200	100		
P.1.2	230	130			270	160	170	90		
P.1.3	190	100			225	130	140	80		
P.1.4	230	130			270	160	170	90		
P.1.5	210	110			240	140	160	90		
P.2.1	230	130			270	160	170	90		
P.2.2	170	100			200	120	130	70		
P.2.3	230	130			270	160	170	90		
P.2.4	160	90			180	110	120	60		
P.3.1	230	130			270	160	170	90		
P.3.2	150	110			180	140	140	80		
P.3.3	130	90			150	120	120	70		
P.4.1	150	110			180	140	140	80		
P.4.2	150	100			170	130	130	70		
M.1.1	230	130	230	140	270	160	170	90		
M.2.1			200	120						
M.3.1										
K.1.1	275	200			360	90	150	110	200	150
K.1.2	150	100			360	90	150	110	150	120
K.2.1	180	100			230	170	150	110	200	150
K.2.2	150	100			160	110	150	110	160	130
K.3.1	180	100			210	160			200	150
K.3.2	180	100			210	160			150	120
N.1.1										1200
N.1.2										800
N.2.1										880
N.2.2										800
N.2.3										230
N.3.1										280
N.3.2										280
N.3.3										160
N.4.1										260
S.1.1				50						
S.1.2				45						
S.2.1				24						
S.2.2				16						
S.2.3				20						
S.3.1				50						
S.3.2				32						
S.3.3				25						
H.1.1	140	80								
H.1.2	120	70								
H.1.3	80	40								
H.1.4										
H.2.1										
H.3.1										
O.1.1									180	150
O.1.2										
O.2.1									260	230
O.2.2										
O.3.1									450	

Kesme verileri, örn. takım ve iş parçası bağlama stabilitesi, malzeme ve makine tipi gibi harici koşullara çok bağlıdır! Belirtilen değerler, kullanım koşullarına bağlı olarak yakl. **±%20** düzeltilmesi gereken olası kesme verilerini temsil eder!

Sistem R 1000, 1002, 1007

Kesme değerleri tablosu

		f_z / a_p mm	WTN1205	WAN2225	WAN1240	WAX1240	WUN4210
Çelik							
	0702	f_z	**0,1–0,7**			**0,2–0,5**	0,1–0,2
		a_p	**0,1–0,7**			**0,1–0,75**	0,1–0,2
	1003	f_z	**0,1–0,3**		**0,2–0,9**	**0,2–0,7**	0,15–0,3
		a_p	**0,1–1,0**		**0,2–1,5**	**0,2–1,5**	0,1–0,3
	12T3	f_z	**0,1–0,3**		**0,25–1,0**	**0,–0,8**	0,15–0,3
		a_p	**0,1–1,5**		**0,2–2,0**	**0,2–2,0**	0,1–0,3
	1604	f_z	**0,2–0,3**		**0,3–1,2**	**0,25–1,0**	0,15–0,3
		a_p	**0,2–1,5**		**0,25–3,0**	**0,2–3,0**	0,1–0,4
Paslanmaz çelik							
	0702	f_z	0,1–0,2			0,2–0,5	0,1–0,2
		a_p	0,1–0,2			0,1–0,75	0,1–0,2
	1003	f_z	0,15–0,3	**0,15–0,6**		0,2–0,7	0,15–0,3
		a_p	0,1–0,3	**0,4–1,0**		0,2–1,5	0,1–0,3
	12T3	f_z	0,15–0,3	**0,2–0,8**		0,–0,8	0,15–0,3
		a_p	0,1–0,3	**0,5–2,0**		0,2–2,0	0,1–0,3
	1604	f_z	0,15–0,3	**0,3–1,0**		0,25–1,0	0,15–0,3
		a_p	0,1–0,3	**0,6–3,0**		0,2–3,0	0,1–0,3
Dökme demir							
	**0702**	f_z	**0,1–0,3**			0,1–0,3	0,1–0,3
		a_p	**0,1–0,7**			0,1–0,7	0,1–0,7
	**1003**	f_z	**0,15–0,3**		0,1–0,3	0,1–0,3	0,15–0,3
		a_p	**0,1–1,0**		0,1–1,0	0,1–1,0	0,1–1,0
	**12T3**	f_z	**0,15–0,4**		0,1–0,4	0,1–0,4	0,15–0,4
		a_p	**0,1–1,5**		0,1–1,15	0,1–1,5	0,1–1,5
	**1604**	f_z	**0,2–0,5**		0,2–0,05	0,2–0,5	0,2–0,5
		a_p	**0,2–3,0**		0,2–2,0	0,2–3,0	0,2–3,0

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Sistem R 1000, 1002, 1007

Kesme değerleri tablosu

		f_z / a_p mm	WTN1205	WAN2225	WAN1240	WAX1240	WUN4210
Demir dışı metaller							
	0702	f_z					**0,1–0,3**
		a_p					**0,1–1,0**
	1003	f_z					**0,1–0,3**
		a_p					**0,1–1,5**
	12T3	f_z					**0,1–0,4**
		a_p					**0,1–2,0**
	1604	f_z					**0,2–0,5**
		a_p					**0,2–4,0**
Isıya dayanıklı alaşımlar							
	1003	f_z		**0,1–0,4**			
		a_p		**0,2–1,0**			
	12T3	f_z		**0,15–0,5**			
		a_p		**0,3–1,5**			
	1604	f_z		**0,15–0,5**			
		a_p		**0,3–2,0**			
Sertleştirilmiş malzemeler							
	0702	f_z	**01–0,2**				
		a_p	**0,1–0,3**				
	1003	f_z	**0,1–0,2**				
		a_p	**0,1–0,5**				
	12T3	f_z	**0,1–0,25**				
		a_p	**0,1–0,7**				
	1604	f_z	**0,15–0,3**				
		a_p	**0,2–1,0**				
Metal dışı malzemeler							
	0702	f_z					0,1–0,3
		a_p					0,1–1,0
	1003	f_z					0,1–0,3
		a_p					0,1–1,5
	12T3	f_z					0,1–0,4
		a_p					0,1–2,0
	1604	f_z					0,2–0,5
		a_p					0,2–4,0

WTN 1205

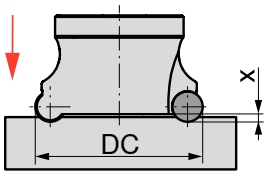
48 HRC'ye kadar: Tabloda belirtilen şekilde a_p aralığı
55 HRC'ye kadar: maksimum değer a_p x 0,7
65 HRC'ye kadar: maksimum değer a_p x 0,5

Sistem R 1000, 1002, 1007

İşleme stratejisi

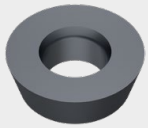
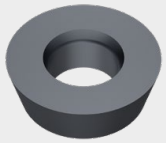
Eksenel dalma





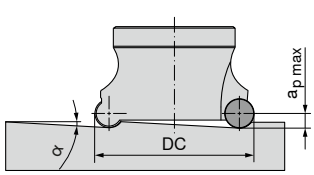
Tabloda verilen f_z'i %30 a düşürün

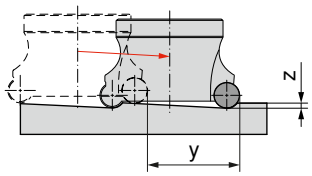
→ v_c Sayfa 182–184

	07 	10 	12 	16 
Ø DC mm	$X_{max.}$ mm	$X_{max.}$ mm	$X_{max.}$ mm	$X_{max.}$ mm
8–160	1,2	2,5	3,0	4,0

Açılı frezeleme (Rampa)

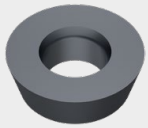
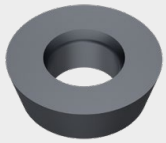






y = Radyal yönde min. hareket
z = Eksenel yönde maksimum dalma
a_p / f_z uygulama tablosu

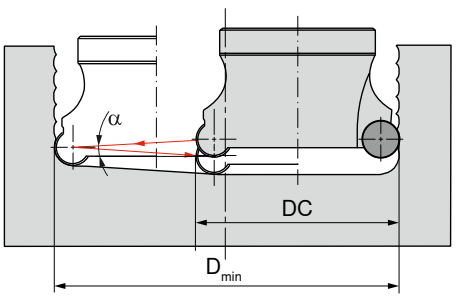
→ v_c Sayfa 182–184

	07 			10 			12 			16 		
Ø DC mm	α°	y mm	z mm	α°	y mm	z mm	α°	y mm	z mm	α°	y mm	z mm
8												
10												
12												
14												
15	26,5	2	< 1,2									
16	14,0	4	< 1,2									
18	11,3	6	< 1,2									
20	8,5	8	< 1,2									
22												
24												
25	5,3	13	< 1,2	19,7	7	< 2,5						
30	3,8	18	< 1,2	11,7	12	< 2,5						
32												
35	3,0	23	< 1,2	8,4	17	< 2,5	13,0	13	< 3,0	38,7	5	< 4,0
40												
42	2,3	30	< 1,2	5,9	24	< 2,5	8,5	20	< 3,0			
50												
52				4,2	34	< 2,5	5,7	30	< 3,0	10,3	22	< 4,0
66							3,9	44	< 3,0	6,4	36	< 4,0
80							3,0	58	< 3,0	4,6	50	< 4,0
100										3,3	70	< 4,0
125										2,4	95	< 4,0
160										1,8	130	< 4,0

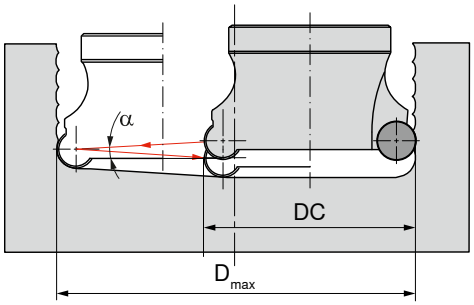
Sistem R 1000, 1002, 1007

İşleme stratejisi

Helisel dalma



D_{min} = takım çapına bağlı olarak en küçük delme çapı



D_{maks} = takım çapına bağlı olarak en büyük delme çapı

a_p / f_z uygulama tablosuna göre
→ v_c Sayfa 182–184

	07			10			12			16		
ØDC mm	α°	y mm	z mm	α°	y mm	z mm	α°	y mm	z mm	α°	y mm	z mm
8												
10												
12	24											
14	28											
15	30											
16	32											
18	36	20	36									
20	40	22	40									
22				24	44							
24				26	48							
25	50	32	50									
30	60	42	60									
32						34	64					
35	80	72	70	48	70	40	70			38,7	5	< 4,0
40								42	80			
42	84	66	84	62	84							
50								62	100			
52		86	104	82	104	74	104			10,3	22	< 4,0
66				110	132	102	132	94	132	6,4	36	< 4,0
80				138	160	130	160	122	160	4,6	50	< 4,0
100						170	200	162	200	3,3	70	< 4,0
125						220	250	212	250	2,4	95	< 4,0
160						290	320	282	320	1,8	130	< 4,0

Sistem MaxiMill 252

İşleme stratejisi

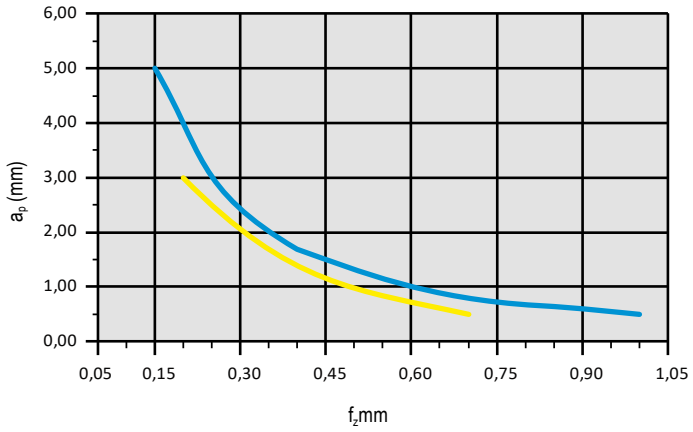
tavsiye edilen kesme derinliği

	4-yüzlü	
Ø mm	$a_{p\,max}$ mm	mm
10	2,5	4,5
12	3,0	5,5

Başlangıç parametreleri



RNHU 10

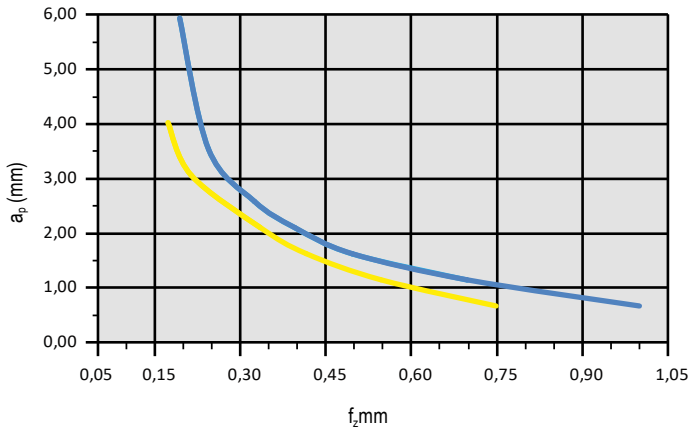


Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**XOLX120410SR-M50**	**CTPP235**	180	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**XOLX120410ER-M50**	**CTPM240**	180	Kuru

Başlangıç parametreleri



RNHU 12



Malzeme			Takma Uç		v_c m/min	Soğutma
Çelik	**P.2.2**	40CrMnMoS 8-6	**XOLX120410SR-M50**	**CTPP235**	180	Kuru
Paslanmaz çelik	**M.1.1**	X6CrNiMoTi 1712 2	**XOLX120410ER-M50**	**CTPM240**	180	Kuru

Her malzeme ile ilgili detaylı kesme hızı bilgileri için bkz. → Sayfa 146–148

Kesme hızı v_c > 400 m/min üzerinde olduğunda takım balansı alınmalıdır!

K200 kopya frezesi için kesme verileri referans değerleri.

İçindekiler	CTPK226		CTPP211		CTPK231		CTCN211		CTPP216		● 1. Tercih ○ Uygun		
	R	F	R	F	R	F	R	F	R	F	Emülsiyon	Basınçlı hava	Karışım
	v_c (m/dak)												
P.1.1		280–300	180–220	220–280	160–200				220–300	280–300	○	●	●
P.1.2		220–240	180–220	220–280	160–200				220–300	280–300	○	●	●
P.1.3		220–240	180–220	220–280	160–200				220–300	280–300	○	●	
P.1.4		220–240	180–220	220–280	160–200				220–300	280–300	○	●	
P.1.5		220–240	180–220	220–280	160–200				220–300	280–300	○	●	
P.2.1		280–300	180–220	220–280	160–200				220–300	280–300	○	●	●
P.2.2		280–300	180–220	220–300	160–200				220–300	280–300	○	●	●
P.2.3		280–300	180–220	240–320	160–200				250–360	240–320	○	●	
P.2.4		280–300	180–220	240–320	160–200				250–360	240–320	○	●	
P.3.1		280–300	180–220	220–280	160–200				220–300	280–300	○	●	
P.3.2		280–320	180 – 220	240–320	160–200				250–360	240–320	○	●	●
P.3.3		280–320	180 – 220	240–320	160–200				250–360	240–320	○	●	●
P.4.1		220–220	140–180	200–240	120–180				140–180	200–240	○	●	
P.4.2		220–220	140–180	200–240	120–180				140–180	200–240	○	●	
M.1.1		180–200	140–160	180–200	120–160				220–250	220–240	●	○	
M.2.1		180–200	140–160	180–240	120–160				220–250	220–240	●		
M.3.1		220–220	140–180	200–240	120–180				140–180	200–240	●		
K.1.1		280–300	160–200	200–300	120–200				240–350	240–260		●	○
K.1.2		280–300	160–200	200–300	120–200				240–350	240–260		●	○
K.2.1		280–300	160–200	200–300	120–200				240–350	240–260		●	○
K.2.2		300–350	180–220	240–350	180–200				340–400	240–360		●	○
K.3.1		300–350	180–220	240–350	180–200				340–400	240–360		●	○
K.3.2		240–260	160–200	220–260	160–200				280–340	220–300		●	○
N.1.1			240–280	300–600	300–600					400–450	●		
N.1.2			240–280	300–600	300–600					400–450	●		
N.2.1			240–280	300–600	300–600					400–450	●		
N.2.2			240–280	300–600	300–600					400–450	●		
N.2.3										300–400	●		
N.3.1			240–280	280–320	240–280					300–400	●		
N.3.2			240–280	280–320	240–280					300–400	●		
N.3.3			240–280	280–320	240–280					300–400	●		
N.4.1			300–400	300–400				300–400			●		
S.1.1				80–120	80–120					60–80	●		
S.1.2				80–120	80–120					60–80	●		
S.2.1				80–120	80–120					60–80	●		
S.2.2				80–120	80–120					60–80	●		
S.2.3				80–120	80–120					60–80	●		
S.3.1				60–80	80–120					60–80	●		
S.3.2				60–80	60–80					60–80	●	○	
S.3.3				60–80	60–80					60–80	●	○	
H.1.1		240–260		280–300	140–160				240–260	240–260		●	
H.1.2		240–260		280–300	80–100				220–240	160–240		●	○
H.1.3		200–220		240–260					120–140	100–140		●	○
H.1.4		120–140		160–200								●	○
H.2.1		240–260		280–300	80–100				220–240	160–240		●	○
H.3.1		240–260		280–300	80–100				220–240	160–240		●	
O.1.1			300–400	300–400						300–350		●	
O.1.2			500–600	500–600						600–800		●	
O.2.1			300–400	300–400								●	
O.2.2			300–400	300–400								●	
O.3.1							400–600	600–800				●	

K200 kopya frezesi için kesme verileri referans değerleri.

İçindekiler	Kaba işleme (R)		Finiş işleme (F)		yalnızca -MR3 için kaba işleme (R)		● 1. Tercih ○ Uygun		
	Ø 6-16	Ø 20-32	Ø 6-16	Ø 20-32	Ø 6-16	Ø 20-32	Emülsiyon	Basınçlı hava	Karışım
	f_z (mm/diş)								
P.1.1	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,8**	**1,2–1,5**	○	●	●
P.1.2	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,8**	**1,2–1,5**	○	●	●
P.1.3	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,8**	**1,2–1,5**	○		●
P.1.4	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,6**	**0,8–1,25**	○		●
P.1.5	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,6**	**0,8–1,25**	○		●
P.2.1	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,8**	**1,2–1,5**	○	●	●
P.2.2	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,6**	**0,8–1,25**	○	●	●
P.2.3	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,6**	**0,8–1,25**	○		●
P.2.4	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,6**	**0,8–1,25**	○		●
P.3.1	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,8**	**1,2–1,5**	○		●
P.3.2	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,6**	**0,8–1,25**	○	●	●
P.3.3	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,6**	**0,8–1,25**	○	●	●
P.4.1	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,8**	**1,2–1,5**	○		●
P.4.2	0,08–0,4	**0,25–0,5**	**0,08–0,3**	**0,2–0,8**	**0,3–0,8**	**1,2–1,5**	○		●
M.1.1	0,08–0,4	**0,25–0,5**	0,08–0,3	0,2–0,5	**0,3–0,6**	0,8–1,5	●	○	
M.2.1	0,08–0,4	**0,25–0,5**	0,08–0,4	0,2–0,6	**0,3–0,6**	0,8–1,25	●		
M.3.1	0,08–0,4	**0,25–0,5**	0,08–0,5	0,2–0,7	**0,3–0,6**	0,8–1,25	●		
K.1.1	0,08–0,4	**0,25–0,5**	0,08–0,3	0,2–0,5	**0,3–0,8**	1,0–1,5		●	○
K.1.2	0,08–0,5	**0,25–0,6**	0,08–0,4	0,2–0,6	**0,3–0,8**	1,0–1,5		●	○
K.2.1	0,08–0,6	**0,25–0,7**	0,08–0,5	0,2–0,7	**0,3–0,8**	1,0–1,5		●	○
K.2.2	0,08–0,7	**0,25–0,8**	0,08–0,6	0,2–0,8	**0,3–0,6**	0,8–1,25		●	○
K.3.1	0,08–0,8	**0,25–0,9**	0,08–0,7	0,2–0,9	**0,3–0,6**	0,8–1,25		●	○
K.3.2	0,08–0,9	**0,25–0,10**	0,08–0,8	0,2–0,10	**0,3–0,6**	0,8–1,25		●	○
N.1.1	0,08–0,35	0,25–0,45	0,06–0,25	0,025–0,45			●		
N.1.2	0,08–0,36	0,25–0,46	0,06–0,26	0,025–0,46			●		
N.2.1	0,08–0,37	0,25–0,47	0,06–0,27	0,025–0,47			●		
N.2.2	0,08–0,38	0,25–0,48	0,06–0,28	0,025–0,48			●		
N.2.3	0,08–0,39	0,25–0,49	0,06–0,29	0,025–0,49			●		
N.3.1	0,08–0,40	0,25–0,50	0,06–0,30	0,025–0,50			●		
N.3.2	0,08–0,41	0,25–0,51	0,06–0,31	0,025–0,51			●		
N.3.3	0,08–0,42	0,25–0,52	0,06–0,32	0,025–0,52			●		
N.4.1	0,08–0,43	0,25–0,53	0,06–0,33	0,025–0,53			●		
S.1.1	0,08–0,3	0,15–0,4	0,05–0,2	0,15–0,25	0,25–0,5	0,6–1,0	●		
S.1.2	0,08–0,3	0,15–0,4	0,05–0,2	0,15–0,25	0,25–0,5	0,6–1,0	●		
S.2.1	0,08–0,3	0,15–0,4	0,05–0,2	0,15–0,25	0,25–0,5	0,6–1,0	●		
S.2.2	0,08–0,3	0,15–0,4	0,05–0,2	0,15–0,25	0,25–0,5	0,6–1,0	●		
S.2.3	0,08–0,3	0,15–0,4	0,05–0,2	0,15–0,25	0,25–0,5	0,6–1,0	●		
S.3.1	0,08–0,3	0,15–0,4	0,05–0,2	0,15–0,25	0,25–0,5	0,6–1,0	●		
S.3.2	0,08–0,35	0,4–0,5	0,08–0,3	0,25–0,5	0,25–0,5	0,6–1,0	●	○	
S.3.3	0,08–0,35	0,4–0,5	0,08–0,3	0,25–0,5	0,25–0,5	0,6–1,0	●	○	
H.1.1								●	
H.1.2								●	○
H.1.3								●	○
H.1.4								●	○
H.2.1								●	○
H.3.1								●	
O.1.1								●	
O.1.2								●	
O.2.1								●	
O.2.2								●	
O.3.1								●	

Azami eksenel kesme derinliği$_p$ K200 kopya frezesi için.



Küresel uçlar									
Uç Ø (mm)		6	8	10	12	16	20	25	32
		$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$
ROHX-FM3	**R**	0,8	1,0	1,5	2,0	3,0	4,0	5,0	6,0
	F	0,4	0,8	1,0	1,2	1,5	1,5	2,0	2,0
ROHX-FM4	**R**	0,8	1,0	2,0	3,0	4,0	5,0	6,0	8,0
	F	0,4	0,8	1,0	1,2	1,5	1,5	2,0	2,0
ROHX-FM6	**R**	0,8	1,0	1,5	2,0	3,0	4,0	5,0	6,0
	F	0,4	0,8	1,0	1,2	1,5	1,5	2,0	2,0
ROGX-MR4	**R***				4,0	6,0	8,0	12,0	16,0
	F				2,0	3,0	4,0	5,0	6,0
ROHX-MR5	**R**		1,5	2,0					
	F		0,8	1,0					

*Komple kanal işlemede a_p değeri maksimum çapın % 25 'i kadar olmalıdır!



Torus uçlar									
Uç Ø (mm)		6	8	10	12	16	20	25	32
		$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$	$a_{p\ max.}$
XOHX-FM5	**R**		2,0	3,0	3,0	4,0	5,0	6,0	8,0
	F		0,6	2,0	2,4	3,2	4,0	5,0	6,4
XOHX-MR6	**R**		2,0	3,0	3,0	4,0	5,0	6,0	8,0
	F		0,6	2,0	2,4	3,2	4,0	5,0	6,4
XOHX-FM1	**R**			1,5	2,0	3,0	4,0		
	F			0,8	0,8	1,0	1,0		
XOHX-FM2	**R**		1,0	1,5	2,0	3,0	4,0	5,0	
	F		0,5	0,7	0,8	1,0	1,0	1,5	
XOHX-MR2	**R**	0,8	1,0	1,5	2,0	3,0	4,0	5,0	
	F	0,5	0,5	0,7	0,8	1,0	1,0	1,5	
XOGX-MF4	**R**			1,5	2,0	3,0	4,0		
	F			0,7	0,8	1,0	1,0		
XOHX-MR3	**R**			0,5	0,6	0,8	1,0		
	F								

Geometrilere göre uygulama alanları

Takma Uç	F	M	R	Ana uygulama
XOHX-FM1	●	●		Çelik, çelik döküm, ısıya dayanıklı çelik, 60 HRC'ye kadar sertleştirilmiş çelik.
XOHX-FM2	●	●		Çelik, çelik döküm, ısıya dayanıklı çelik, 60 HRC'ye kadar sertleştirilmiş çelik.
ROHX-FM3	●	●		Çelik, çelik döküm, ısıya dayanıklı çelik
ROHX-FM4	●	●		Çelik, çelik döküm, ısıya dayanıklı çelik, 60 HRC'ye kadar sertleştirilmiş çelik.
XOHX-FM5	●	●		Çelik, çelik döküm, ısıya dayanıklı çelik, 60 HRC'ye kadar sertleştirilmiş çelik.
ROHX-FM6	●	●	●	Demir dışı metaller, plastik, grafit
XOHX-MR2		●	●	Uzun talaş veren demir esaslı malzemeler
XOHX-MR3		●	●	Çelik, çelik döküm, ısıya dayanıklı çelik
ROGX-MR4		●	●	Çelik, çelik döküm, ısıya dayanıklı çelik
XOGX-MF4	●	●		Çelik, çelik döküm, ısıya dayanıklı çelik
ROHX-MR5		●	●	Uzun talaş veren demir esaslı malzemeler
XOHX-MR6		●	●	Uzun talaş veren demir esaslı malzemeler

MaxiMill Slot-SX ayırıcı freze için kesme verileri referans değerleri

İçindekiler	CTCP335	CTP1340	H216T
	v_c m/min.		
P.1.1	**240**	**190**	
P.1.2	**210**	**160**	
P.1.3	**180**	**140**	
P.1.4	**160**	**130**	
P.1.5	**140**	**120**	
P.2.1	**220**	**170**	
P.2.2	**160**	**130**	
P.2.3	**140**	**120**	
P.2.4	**100**	**80**	
P.3.1	**130**	**120**	
P.3.2	**110**	**100**	
P.3.3	**90**	**80**	
P.4.1	**140**	**120**	
P.4.2	**120**	**110**	
M.1.1	110	**130**	
M.2.1	100	**120**	
M.3.1	80	**100**	
K.1.1	**300**	200	140
K.1.2	**240**	180	115
K.2.1	**200**	120	150
K.2.2	**160**	100	110
K.3.1	**190**	120	170
K.3.2	**160**	100	140
N.1.1		300	**500**
N.1.2		200	**330**
N.2.1		250	**370**
N.2.2		220	**330**
N.2.3		200	**280**
N.3.1		300	**350**
N.3.2		300	**350**
N.3.3		200	**320**
N.4.1		200	**320**
S.1.1		**70**	
S.1.2		**60**	
S.2.1		**35**	
S.2.2		**25**	
S.2.3		**30**	
S.3.1		**60**	
S.3.2		**50**	
S.3.3		**40**	
H.1.1			
H.1.2			
H.1.3			
H.1.4			
H.2.1			
H.3.1			
O.1.1			160
O.1.2			
O.2.1			240
O.2.2			
O.3.1			

Ortalama talaş kalınlığı

h_m mm

$$h_m = f_z \sqrt{\frac{a_e}{DC}}$$

Diş başına ilerleme

$f_z$mm

$$f_z = h_m \sqrt{\frac{DC}{a_e}}$$

İlerleme oranı

v_f mm/min

$$v_f = f_z \times ZNF \times n$$

DC = Kanal freze Ø

ZNF = Frezenin kesici ağız sayısı

Referans takım 50 386 12504 – ASLOT.125.R.8.32.DC-SX4

	SX4 -F2				SX4 -M1				SX4 -M7			
	a_e	10	20	30	a_e	10	20	30	a_e	10	20	30
	hm	$f_z$mm			**hm**	$f_z$mm			**hm**	$f_z$mm		
P	**0,08**	0,28	0,20	0,16	**0,1**	0,30	0,25	0,20	**0,09**	0,30	0,23	0,18
M	**0,05**	0,18	0,13	0,10					**0,06**	0,21	0,15	0,12
K					**0,12**	0,30	0,30	0,24	**0,09**	0,30	0,23	0,18
N	**0,08**	0,28	0,20	0,16								
S	**0,04**	0,14	0,10	0,08								
H												
O												

Referans takım 50 386 12504 – ASLOT.125.R.8.32.DC-SX4

	SX4 -M8				SX4 -27P			
	a_e	10	20	30	a_e	10	20	30
	hm	$f_z$mm			**hm**	$f_z$mm		
P	**0,08**	0,28	0,20	0,16				
M	**0,05**	0,18	0,13	0,10				
K					**0,06**	0,21	0,15	0,12
N	**0,08**	0,28	0,20	0,16	**0,09**	0,30	0,23	0,18
S	**0,04**	0,14	0,10	0,08				
H								
O					**0,05**	0,18	0,13	0,10

Dikkat: Daha dar ve daha geniş değiştirilebilir kesici uçlarda diş başına ilerlemeyi buna göre azaltın veya arttırın!

Kesme verileri, örn. takım ve iş parçası bağlama stabilitesi, malzeme ve makine tipi gibi harici koşullara çok bağlıdır! Belirtilen değerler, kullanım koşullarına bağlı olarak yakl. **±%20** düzeltilmesi gereken olası kesme verilerini temsil eder!

Kanal frezeleri TX için kesme verileri

İçindekiler	CWX500		CWK10
	v_c (m/dak)	hm (mm)	v_c (m/dak)
P.1.1	160	0,10	
P.1.2	140	0,10	
P.1.3	110	0,08	
P.1.4	110	0,10	
P.1.5	90	0,08	
P.2.1	110	0,10	
P.2.2	90	0,08	
P.2.3	90	0,10	
P.2.4	80	0,08	
P.3.1	80	0,05	
P.3.2	60	0,10	
P.3.3	50	0,08	
P.4.1	100	0,05	
P.4.2	90	0,08	
M.1.1	110	0,08	
M.2.1	90	0,08	
M.3.1	70	0,08	
K.1.1	140	0,10	
K.1.2	100	0,10	
K.2.1	90	0,08	
K.2.2	80	0,05	
K.3.1	140	0,10	
K.3.2	120	0,10	
N.1.1	600	0,12	250
N.1.2	400	0,12	230
N.2.1	220	0,10	210
N.2.2	180	0,10	190
N.2.3	140	0,10	120
N.3.1	240	0,12	200
N.3.2	200	0,12	180
N.3.3	180	0,12	160
N.4.1	180	0,12	160
S.1.1	60	0,05	
S.1.2	50	0,05	
S.2.1	60	0,05	
S.2.2	50	0,05	
S.2.3	40	0,05	
S.3.1	60	0,06	
S.3.2	40	0,06	
S.3.3	30	0,06	
H.1.1			
H.1.2			
H.1.3			
H.1.4			
H.2.1			
H.3.1			
O.1.1	180	0,10	160
O.1.2	180	0,10	160
O.2.1	150	0,10	120
O.2.2	110	0,10	100
O.3.1	170	0,10	160

Ortalama talaş kalınlığı

h_m mm

$$h_m = f_z \sqrt{\frac{a_e}{DC}}$$

Diş başına ilerleme

$f_z$mm

$$f_z = h_m \sqrt{\frac{DC}{a_e}}$$

İlerleme oranı

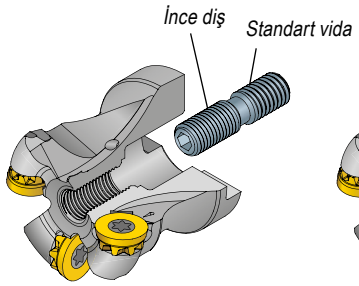
v_f mm/min

$$v_f = f_z \times ZNF \times n$$

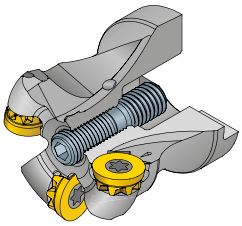
DC = Kanal freze Ø

ZNF = Frezenin kesici ağız sayısı

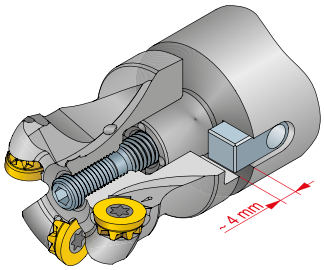
CERATIZIT Power vida ile kolay ve güvenli sıkıştırma



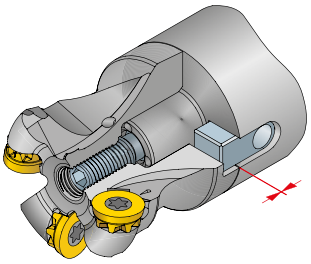
Power vidanın ince dişli kısmı freze kafasına takılır.



Sıkma sırasında power vida durana kadar döndürülür

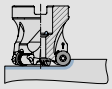
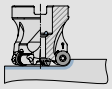
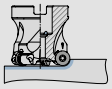


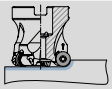
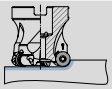
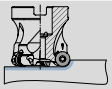
Takım ve tutucunun ideal bağlantısını sağlamak için, sıkıştırma öncesinde freze ve adaptör arasında 4 mm'lik boşluk gereklidir. Standart tutucular kullanıldığında bu otomatik olarak sağlanır. Gerekirse, power vida yardımı ile tekrar 0,5 mm/dev. ayarlama yapabilirsiniz.



Power vidayı sıkmak için döndürün

Freze kafalarını tutucu adaptöre bağlayan vidaların tork momentleri

	 10 				 12 				 16 			
Freze Ø mm	ISK-vida DIN 912	M_d Nm	İlgili vida Ürün kodu	M_d Nm	ISK-vida DIN 912	M_d Nm	İlgili vida Ürün kodu	M_d Nm	ISK-vida DIN 912	M_d Nm	İlgili vida Ürün kodu	M_d Nm
40			70 950 151	15			70 950 151	15				
42			70 950 151	15			70 950 151	15				
50	M10x25	80			M10x25	80					70 950 154	20
52					M10x25	80					70 950 154	20
63					M10x25	80			M10x25	80		
66					M10x25	80			M10x25	80		

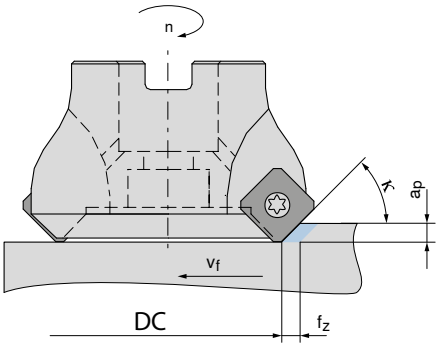
	 12 				 16 				 20 			
Freze Ø mm	ISK-vida DIN 912	M_d Nm	İlgili vida Ürün kodu	M_d Nm	ISK-vida DIN 912	M_d Nm	İlgili vida Ürün kodu	M_d Nm	ISK-vida DIN 912	M_d Nm	İlgili vida Ürün kodu	M_d Nm
80	M12x30	140			M12x30	140			M12x30	140		
100	M16x35	180			M16x35	180			M16x35	180		
125					M16x35	180			M16x35	180		

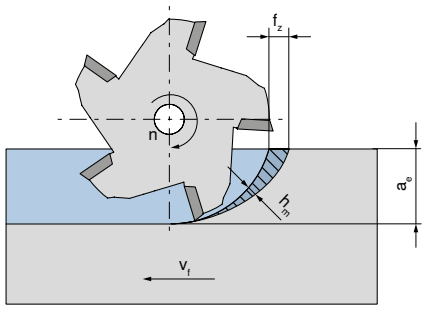
15

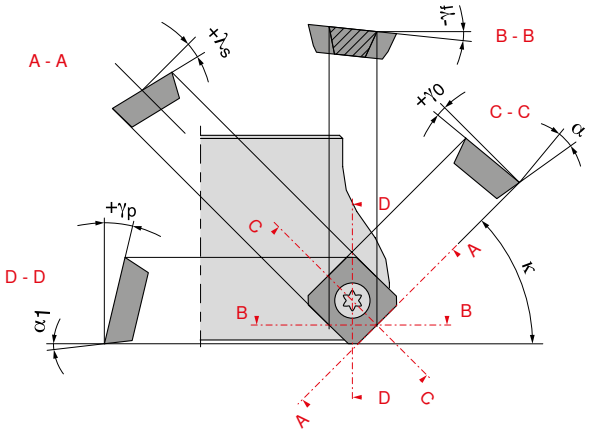
Kısa tanımlar ve boyutlar

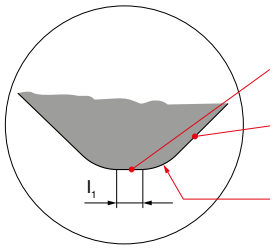
a_e	Kesme genişliği	mm
a_p	Kesme derinliği	mm
DC	Takım çapı	mm
D_w	İş parçası genişliği	mm
f_z	Diş başına ilerleme	mm
h_m	Ortalama talaş kalınlığı	mm
k	Ağız sayısı	
k_c	Spesifik kesme kuvveti	N/mm²
$k_{c1.1}$	1 mm² talaş kesiti için spesifik kopma mukavemeti	N/mm²
BS	Silici kenar boyu	mm
m_c	Spesifik kesme kuvveti çarpanı	
n	İş mili devir sayısı	1/dak
Q	Talaş hacmi	cm³dak
v_c	Kesme hızı	m/dak
v_f	İlerleme hızı	mm/dak.
ZNF	Efektif uç sayısı	

γ_0	Etkin kesme açısı	derece
γ_f	Radyal kesme açısı	derece
γ_p	Eksenel kesme açısı	derece
κ	Kesme kenarı açısı	derece
λ_s	Eğim açısı	derece
α	Boşluk açısı	derece
α_1	Alt boşluk açısı	derece









Silici düzlük

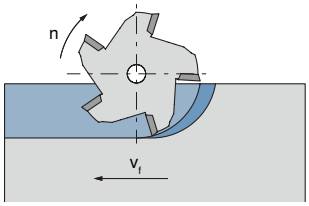
Esas kesme kenarı

Köşe radyusu

müdahale durumları

Önerilen

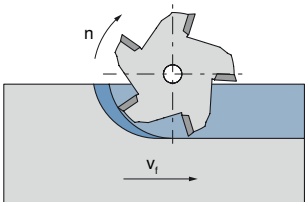
Eş yönlü frezeleme



İş parçasının ilerleme yönü, kesme bölgesinde frezenin dönüş yönü ile aynıdır. Talaş kalınlığı başlangıçta maksimum seviyededir ve kesme sonunda sıfıra ulaşana kadar azalır.

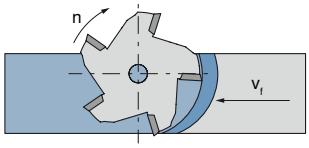
Uygun değil

Zıt yönlü frezeleme

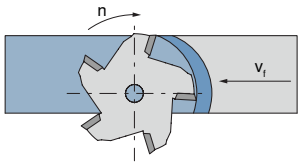


İş parçasının ilerleme yönü, kesme bölgesinde frezenin dönüş yönüne terstir. Talaş kalınlığı başlangıçta sıfırdır ve kesme sonunda maksimuma ulaşana kadar artar.

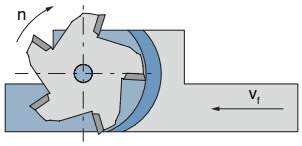
Freze konumlandırma



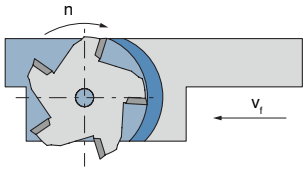
Mümkünse kesme sırasında freze iş parçasından teğetsel olarak dışarı çıkabilecek şekilde yerleştirilmelidir.



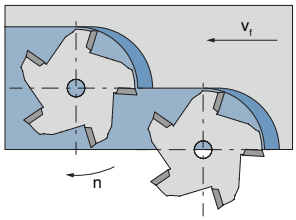
İş parçası konumu



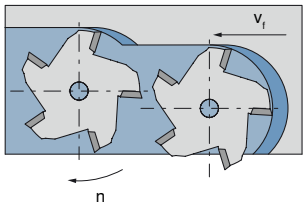
İş parçası, tüm frezeleme boyunca, freze iş parçasından teğetsel olarak dışarı çıkabilecek şekilde bağlanmalıdır.



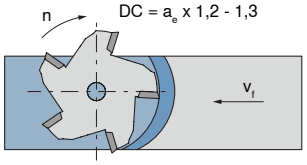
Örtüşme



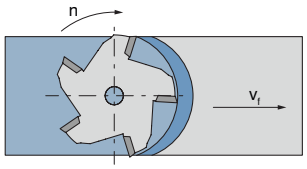
Ya eş yönlü frezeleme uygulayın, ya da soldaki resimde görüldüğü gibi frezenin iş parçasından teğetsel olarak çıkmasını sağlayın.



Freze ölçüsü



Alın frezeleme yaparken frezenin çapı iş parçasının çapından %20–30 daha büyük olmalıdır.



15

Freze uçları için ISO kodlama sistemi

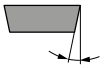
X	D	K	T	11	T3	08	S	R	-	F50
1	2	3	4	5	6	7	8	9		10

Z	N	H	W	12	05	PO	S	R	-	15	06	-	R
1	2	3	4	5	6	7	8	9		11	12		13

1 Uç formu

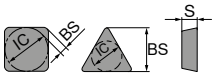
A	85°	
B	82°	
K	55°	
H	120°	
L	90°	
O	135°	
P	108°	
C	80°	
D	55°	
E	75°	
M	86°	
V	35°	
R		
S	90°	
T	60°	
W	80°	
X Z	Özel şekil	

2 Boşluk açısı

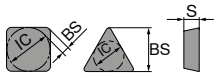


	α
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Özel şekil

3 Toleranslar

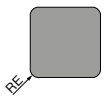


	IC ±mm	BS ±mm	S ±mm	IC = 6,35 / 9,52	IC = 12,7	IC = 15,8 / 19,05
A	0,025	0,005	0,025	●	●	●
C	0,025	0,013	0,025	●	●	●
E	0,025	0,025	0,025	●	●	●
F	0,013	0,005	0,025	●	●	●
G	0,025	0,025	0,13	●	●	●
H	0,013	0,013	0,025	●	●	●
J	0,05	0,005	0,025	●		
	0,08	0,005	0,025		●	
	0,10	0,005	0,025			●
K	0,05	0,013	0,025	●		
	0,08	0,013	0,02		●	
	0,10	0,013	0,02			●



	IC ±mm	BS ±mm	S ±mm	IC = 6,35 / 9,52	IC = 12,7	IC = 15,8 / 19,05
M	0,05	0,08	0,13	●		
	0,08	0,13	0,13		●	
	0,10	0,15	0,13			●
N	0,05	0,08	0,025	●		
	0,08	0,13	0,025		●	
	0,10	0,15	0,025			●
U	0,08	0,13	0,13	●		
	0,13	0,20	0,13		●	
	0,18	0,27	0,13			●

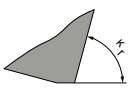
7 Silici düzlük / Köşe radyusu



Radüs

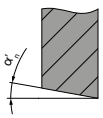
	RE mm
M0*	
02	0,2
04	0,4
08	0,8
12	1,2

* Sadece "R" şekilli uç ile



1. Açı

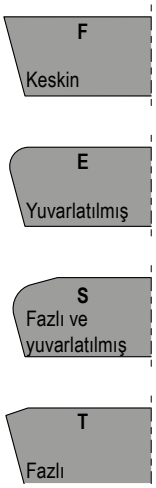
	K_r
A	45°
D	60°
E	75°
F	85°
P	90°
Z	Diğer



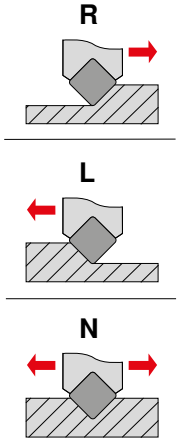
2. Açı

	α'_n
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
Z O	Diğer

8 Kesici kenar



9 Kesme yönü



4

Özellik

A	
F	
G	
M	
N	
Q	
R	
T	
U	
W	
X	Özel şekil

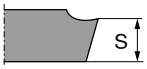
5

Kesme uzunluğu

IC mm	A	T	C/S	H	L	R	V	W	O	X	Z
4,90										07	
5,00						05					
5,56			05		08			03			
6,00											
6,35		11	06		10			04		06	
6,65	10										
6,80										11	
7,00											04
7,94			07								
8,00						08					
9,00					12						
9,30										15	
9,52	16	16	09		15			06	04		
9,57	15										
9,60										09	
10,00			10		11	10					12
12,00						12					
12,50										20	
12,70		12/22	12		20		22	08		12	
15,81			15		22			10			
16,00						16					
16,20				09							
16,74			16								
17,00			17								
17,18									06		
18,18									07		
19,05			19					13			
20,00						20					

6

Uç kalınlığı



	S mm
01	1,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94
09	9,52

10

Talaş kırıcı formu

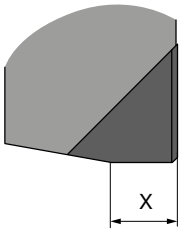
Kademe tanımlaması
F.. = İnce
M.. = Orta
R.. = Kaba işleme

ek karakteristikler:
R = Ana/ yan kesicinin geçiş yarıçapı
Q = Geniş silicili kesme kenarı

11

Üretici bilgisi

Hassas kesimin uzunluğu

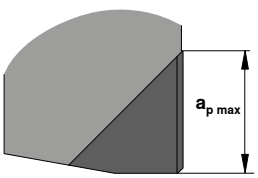


00 = 0,0 mm
10 = 1,0 mm
12 = 1,2 mm
15 = 1,5 mm
30 = 3,0 mm
50 = 5,0 mm

12

Üretici bilgisi

$a_{p\,max}$



02 = 2,0 mm
03 = 3,0 mm
04 = 4,0 mm
06 = 6,0 mm
07 = 7,0 mm
11 = 11,0 mm

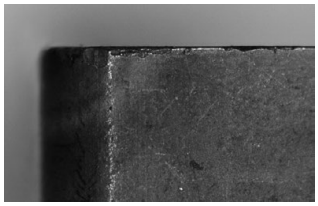
13

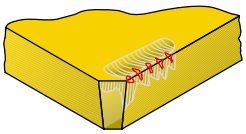
Üretici bilgisi

F = Hassas
M = Orta
R = Kaba işlem

15

Frezeleme sırasındaki kesici kenar aşınmaları

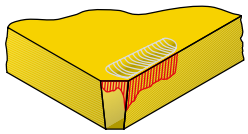




Kenar dökülmesi

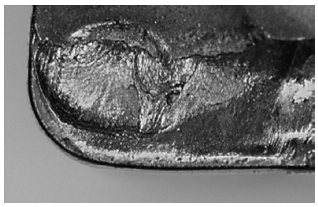
Kesme hızı ↑
Diş başına ilerleme ↓
Uç kalitesinin tokluğu ↑
Kesici kenar pahı ↑

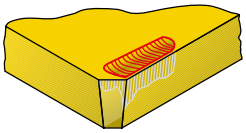




Boşluk yüzeyinde aşınma

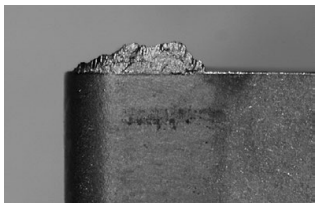
Kesme hızı ↓
Diş başına ilerleme ↑
Aşınmaya daha dayanıklı kalite ↑

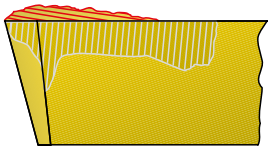




Çukurlaşma

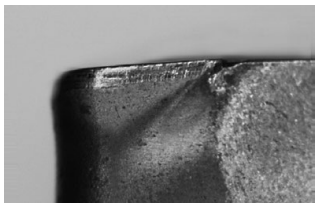
Kesme hızı ↓
Diş başına ilerleme ↓
Aşınmaya daha dayanıklı kalite ↑

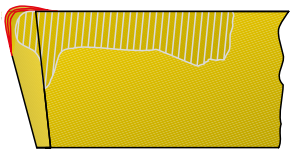




Talaş birikmiş kenarlar – yapışma

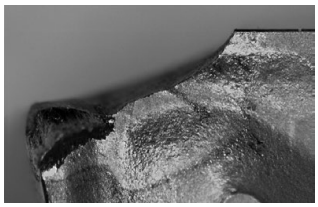
Kesme hızı ↑
Diş başına ilerleme ↑
Aşınma dayanımı ↑

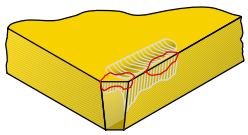




Kesici kenar deformasyonu

Kesme hızı ↓
Diş başına ilerleme ↓
Aşınmaya daha dayanıklı kalite ↑

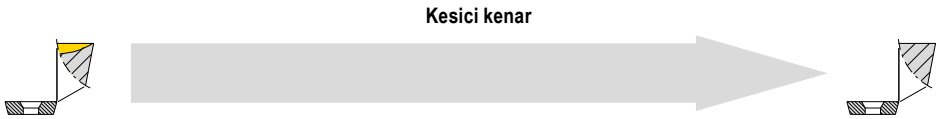




Köşe kırılması (termal çatlama sonucu)

Kesme hızı ↓
Uç kalitesinin tokluğu ↑

Talaş kırıcı genel bakış



arttırımlı kama açısı				Keskin		Orta kaba		Stabil	
				●		● ●		● ● ●	
				10	20	30	40	50	60
	ince	F	▮	-F10 -27 -27P	-F20		-F40	-F50	-ER -FN -33P -33
	Orta kaba	M	▮▮			-M31 -M30 -M32		-M50 -31	-EN -29
	kaba	R	▮▮▮			-R30		-R50	-SN -R60 -SR

Talaş kırıcı kodu

Uygulama tipleri			Kesici kenar		
			Keskin	Orta kaba	Stabil
			10–20	30–40	50–60
	Finiş	F ▮	●	● ●	● ● ●
	üniversal	M ▮▮	●	● ●	● ● ●
	Kaba	R ▮▮▮	●	● ●	● ● ●

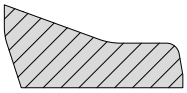
Örnek: Talaş kırıcı -M50



Talaş kırıcı açıklaması

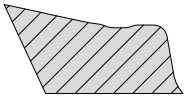
-27P

- Son derece pozitif geometri
- Taşlanmış keskin kesici kenar
- Düşük yapışma eğilimi
- Demir dışı metaller için tavsiye



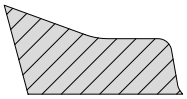
-F10

- Son derece pozitif geometri
- Taşlanmış keskin kesici kenar
- Düşük yapışma eğilimi
- Demir dışı metaller için tavsiye



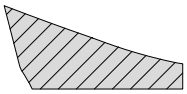
-27

- yüksek pozitif geometri
- keskin kesme kenarı
- Demir dışı metal İlk seçim



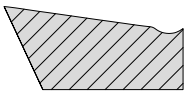
-F20

- Son derece pozitif geometri
- Hafif yuvarlatılmış kesici kenar
- Demir dışı metaller için tavsiye



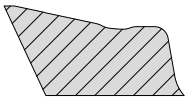
-F40

- Pozitif geometri
- Yuvarlatılmış kesici kenar
- Hassas ve kaba işleme
- Kararsız bağlamalar için
- Isıya dayanıklı malzemeler, titanyum ve süper alaşımlar için tavsiye



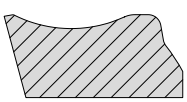
-F50

- Koruyucu pahlı kesime uygun geometri
- Yuvarlatılmış kesici kenar
- Hafif kaba işleme
- Kararsız bağlamalar için
- Paslanmaz çelik malzemeler için tavsiye



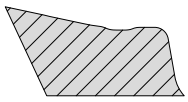
-33P

- Nötre yakın koruyucu pahlı pozitif geometri
- Düşük yapışma eğilimi
- Yuvarlatılmış kesici ağız
- Düşük kesme kuvveti ve iyi stabilite
- Kararsız bağlamalar için
- Hafif kaba işleme
- Paslanmaz çelik malzemeler için ilk tercih



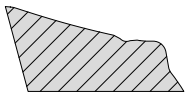
-M30

- Pozitif geometri
- Yuvarlatılmış kesici kenar
- Orta kaba işleme
- Kararsız bağlamalar için
- Martensitik paslanmaz çelikler için tavsiye (türbin kanadı işleme sadece MaxiMill 251 ile)



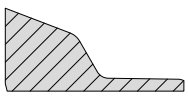
-M31

- Pozitif geometri
- Yuvarlatılmış kesici ağız
- Hassas ve kaba işleme
- Kararsız bağlamalar için
- Titanyum ve süper alaşımlar gibi ısıya dayanıklı malzemeler için



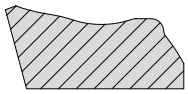
-M32

- Pozitif geometri
- Yuvarlatılmış kesici ağız
- Düşük kesme kuvveti ve iyi stabilite
- Orta kaba işleme
- Martensitik paslanmaz çelikler için ilk tercih



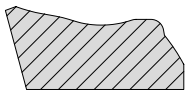
-M50

- Koruyucu pahlı üniversal geometri
- Yuvarlatılmış kesici kenar
- Hafif ile orta arası kaba işleme
- Genel çelik malzemeler için tavsiye



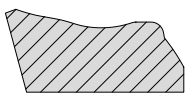
-31

- Nötr koruyucu pahlı pozitif geometri
- Yuvarlatılmış kesici ağız
- Ağır kaba işleme
- Çok darbeli kesim
- Dökme demir malzemeler için ilk tercih



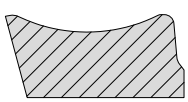
-29

- Hafifçe negatif koruyucu pahlı pozitif geometri
- Yuvarlatılmış kesici ağız
- Düşük kesme kuvveti ve iyi stabilite
- Hafif ile orta arası kaba işleme
- Genel çelik malzemeler için ilk tercih



-33

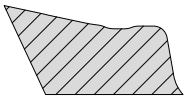
- Nötre yakın koruyucu pahlı pozitif geometri
- Yuvarlatılmış kesici ağız
- Düşük kesme kuvveti ve iyi stabilite
- Kararsız bağlamalar için
- Hafif kaba işleme
- Paslanmaz çelik malzemeler için ilk tercih



Talaş kırıcı açıklaması

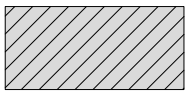
-29R

- Hafifçe negatif koruyucu pahlı pozitif geometri
- İyice yuvarlatılmış kesici ağız
- Düşük kesme kuvveti ve iyi stabilite
- Hafif ile orta arası kaba işleme
- Genel çelik malzemeler için ilk tercih



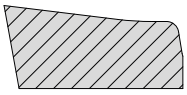
-ER

- Nötr Geometri
- Yuvarlatılmış Kesme Kenarı
- Üniversal Uygulamalar
- Pah nedenniyle yüksek yüzey kalitesi
- İlk Tercih - Döküm ve Nikel alaşımlı malzemeler



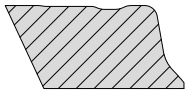
-R30

- Hafif pozitif geometri
- Yuvarlatılmış kesici ağız
- orta kaba işleme
- Çok darbeli kesimler
- Dökme demir malzemeler için ilk tercih



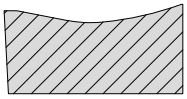
-EN

- Nötr geometri
- Yuvarlatılmış kesici ağız
- Silici düzlük sayesinde yüksek yüzey kalitesi (değiştirilebilir kesici uçta radyal koruyucu pah)
- Dökme demir ve demir dışı metallerin işlenmesi için ilk tercih



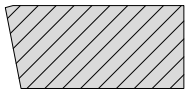
-R50

- Koruyucu pahlı güçlü geometri
- Yuvarlatılmış kesici kenar
- Kaba işleme
- darbeli kesmeler
- Dökme demir malzemeler için tavsiye



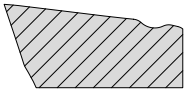
-SN

- Nötr geometri
- yuvarlatılmış kesici ağız
- Silici düzlük sayesinde yüksek yüzey kalitesi (değiştirilebilir kesici uçta radyal koruyucu pah)
- Düşük kesme kuvvetleri
- İyi bir pürüzsüzlük için ilk tercih



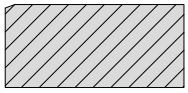
-R60

- Koruyucu pahlı güçlü geometri
- Yuvarlatılmış kesici kenar
- Kaba işleme
- Kararlı bağlamalar için
- Yüksek mukavemetli çelik malzemeler için tavsiye



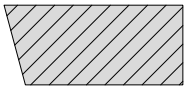
-SR

- Negatif koruyucu pahlı nötr geometri
- Yuvarlatılmış kesici ağız
- Sağlam değiştirilebilir kesici uç
- Kötü işleme şartları için
- Dökme demir ve çelik malzemelerin işlenmesi için ilk tercih



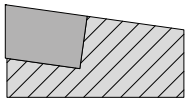
-FN

- Nötr ve büyük ölçüde kararlı geometri
- İyice yuvarlatılmış kesici ağız
- Kararlı işleme durumları için
- Yaklaşık 50 HRC seviyesine kadar sert işleme için ilk tercih



-FR

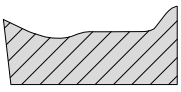
- Nötr Geometri
- Hafif yuvarlatılmış stabil kesme kenarı
- Seramik ve CBN kesme malzemeleriyle ilişkilidir.
- Stabil makine şartları içindir.
- İlk Tercih - Döküm Malzemeler



Spanleitstufenbeschreibung für System MaxiMill Slot-SX

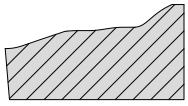
-27P

- pozitif geometri
- Keskin, taşlanmış kesici ağız
- Parlatılmış talaş kırıcı
- Düşük kesme kuvvetleri
- Finish ile orta kaba arasında işleme aralığı
- Demir dışı metaller için ilk tercih



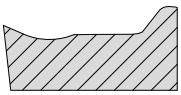
-M8

- Çok pozitif geometri
- Taşlanmış kesici ağız
- Düşük kesme kuvvetleri
- Finish ile orta kaba arasında işleme aralığı
- İşlenmesi zor ve paslanmaz malzemeler için ilk tercih
- Alternatif olarak demir dışı metaller için de kullanılabilir



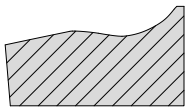
-F2

- pozitif geometri
- Taşlanmış kesici ağız
- Düşük kesme kuvvetleri
- Finish ile orta kaba arasında işleme aralığı
- Paslanmaz ve çelik malzemeler için



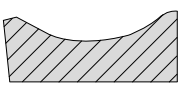
-M7

- Pozitif geometri
- Orta işleme
- üniversal uygulanabilir



-M1

- stabil kesici ağız
- orta ile kaba arasında işleme aralığı
- çelik malzemeler için en iyi uygunluk



Kalitelere genel bakış

Kalitelerin tanımı	Standart tanımlama	ISO- Uygulama aralığı	Çelik P	Paslanmaz çelik M	Dökme demir K	Demir dışı metaller N	Isıya dayanıklı alaşımlar S	Sertleştirilmiş malzemeler H	Metal dışı malzemeler O
CTEP210	HE-P10 HE-K05	01 10 20 30 40 50 / 05 15 25 35 45	●		●				
TCM10	HT-P15 HT-K10		●		○				
WTN1205	HC-P10 HC-M15 HC-K05 HC-H10		●	○	●			●	
CTPP211	HC-P10 HC-M15 HC-K10 HC-N10 HC-S15 HC-H10 HC-O10		●	○	○	○	○	○	○
CTPP216	HC-P10 HC-M20 HC-K15 HC-N15 HC-S20 HC-H15 HC-O15		●	○	●	○	○	●	○
CTCP220	HC-P20 HC-K20		●		●				
CTPP225	HC-P25 HC-K25		●		●				
CTCP230	HC-P30 HC-K25		●		●				
CTPP231	HC-P30 HC-K25		●		○				
CTPP235	HC-P35 HC-M30 HC-K30		●	○	○				
CTPP236	HC-P35 HC-M35 HC-K30		●	○	○				
WAN1240	HC-P40 HC-M35 HC-K30		●	○	○				
WAX1240	HC-P30 HC-M25 HC-K25		●	○	○				
CTPM225	HC-P25 HC-M25		●	●					
WAN2225	HC-M25 HC-S30			●			●		
CTCM235	HC-P40 HC-M35		●	●					
CTPM240	HC-P40 HC-M40		○	●					
CWK10	HC-N10 HC-O10					●			○

● **Ana uygulama**
○ Ek uygulamalar

aşınmaya dayanıklı v_c+ ○ ⟷ ○ v_c– sert

Kalitelere genel bakış

Kalitelerin tanımı	Standart tanımlama	ISO- Uygulama aralığı	Çelik	Paslanmaz çelik	Dökme demir	Demir dışı metaller	Isıya dayanıklı alaşımlar	Sertleştirilmiş malzemeler	Metal dışı malzemeler
		01 05 10 15 20 25 30 35 40 45 50	P	M	K	N	S	H	O
CTPM241	HC-P40								
	HC-M40		●	●			○		
	HC-S40								
CTPM245	HC-P45								
	HC-M50		●	●					
CTCM245	HC-P45								
	HC-M50		●	●			○		
	HC-S35								
CTN3105	CN-K05				●				
CTL3215	BC-K10				●			○	
	BC-H10								
CTCK215	HC-K15				●				
CTPK220	HC-K20				●				
CTPK221	HC-P15								
	HC-K10		○		●				
CTPK226	HC-P15								
	HC-M20								
	HC-K15		●	●	●			○	
	HC-H15								
CTPK231	HC-P30								
	HC-M35								
	HC-K30								
	HC-N30		●	●	●	○	○	○	
	HC-S35								
	HC-H30								
CTD4205	DP-N05								
	DP-O05					●			○
CTPX715	HC-P15								
	HC-M15								
	HC-K15								
	HC-N15		○	○	●	●	○		○
	HC-S20								
	HC-O10								
WUN4210	HT-K10								
	HT-N15				○	●			
CTCN211	HC-N10								
	HC-O10					○			●
CTWN215	HC-K15								
	HC-N10				○	●			○
	HC-O10								
H216T	HW-K15								
	HW-N15				○	●			○
	HW-O15								
CTC5240	HC-S35						●		
CTCS245	HC-S45						●		
CTP6215	HC-K15								
	HC-H15				●			●	
CWX500	HC-P15								
	HC-M15								
	HC-K15								
	HC-N15		●	●	○	●	○		○
	HC-S15								
	HC-O15								

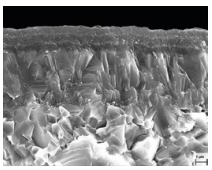
● **Ana uygulama**
○ Ek uygulamalar

aşınmaya dayanıklı v_c+ ⟷ v_c− sert

15

Kaliteler Hakkında Açıklama

CTEP210



P10 | **K05**

Nitelikler:
Bileşim: %12,2 Co/Ni Cermet; %71,4 karışık karbürler; Diğerleri; kalanı WC | Küçük tanecik boyu | Sertlik: HV_{30} 1620 | Katman sistemi: CVD TiCN-Al_3O_3
Uygulama:
Yüksek kesme hızlarında finiş işleme için tokluk rezervlerine sahip kaplamalı Cermet kalitesi

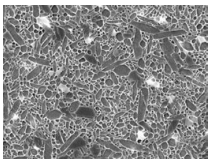
TCM10



P15 | K10

Nitelikler:
Bileşim: %12,2 Co/Ni; WC 15; %10,0 TaNbC; kalanı TiCn | Sertlik: HV_{30} 1620 | Katman sistemi: Kaplamasız
Uygulama:
Sertleştirilmiş çeliğin finiş işlemesi için kaplamasız Cermet kalitesi

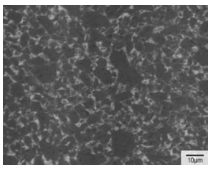
CTN3105



CN-K05

Nitelikler:
Bileşim: ß – Si_3N_4 | İnce tanecik boyu | Sertlik: HV_{30} 1620 | Katman sistemi: Kaplamasız
Uygulama:
Döküm malzemeleri işlemek için üniversal silikon nitrür

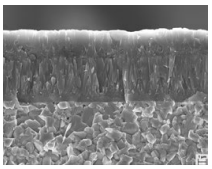
CTL3215



BC-K10 | BC-H10

Nitelikler:
Bileşim: Kübik bor nitrür (CBN) | %85 hacmen + metalik bağlayıcı faz | katman sistemi: PVD
Uygulama:
Döküm malzemelerin işlenmesi için iyi aşınmaya dayanıklılığı ve çok iyi kesici ağız tokluğuna sahip kaplamalı kübik bor nitrür

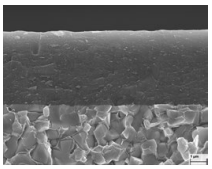
CTCP220



HC-P20 | **HC-K20**

Nitelikler:
Bileşim: %8,0 Co; %2,0 karışık karbür; kalanı WC | 1 - 2 µm orta tanecik boyu | Sertlik: HV_{30} 1500 | Katman sistemi: CVD TiCN-Al_3O_2
Uygulama:
Kuru işleme, yüksek kesme hızı + aşınmaya karşı dayanıklı CTCP230 kalitesi
Malzeme örneği:
Yakl. 250 HB / 840 N/mm²'ye kadar düşük malzeme mukavemeti

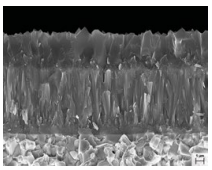
CTPP225



HC-P25 | **HC-K25**

Nitelikler:
Bileşim: %8,0 Co; %2,0 karışık karbür; kalanı WC | 1 - 2 µm orta tanecik boyu | Sertlik: HV_{30} 1500 | Katman sistemi: PVD TiAlTaN
Uygulama:
Kuru veya ıslak işleme, çelik malzemelerde yüzey frezeleme, yüksek kesme hızları + aşınmaya karşı dayanıklı CTPP235 kalitesi
Malzeme örneği:
Yakl. 300 HB / 1000 N/mm²'ye kadar orta malzeme mukavemeti

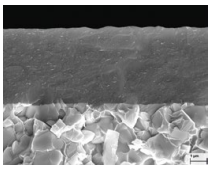
CTCP230



HC-P30 | HC-M25 | **HC-K25**

Nitelikler:
Bileşim: %10,5 Co; %2,0 karışık karbür; kalanı WC | 1 - 2 µm orta tanecik boyu | Sertlik: HV_{30} 1400 | Katman sistemi: CVD TiCN-Al_2O_3
Uygulama:
Kuru işleme, yüksek kesme hızları için üniversal kalite

CTPP235



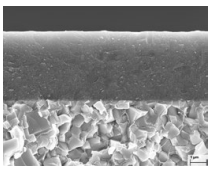
HC-P35 | HC-M30

Nitelikler:
Bileşim: %10,5 Co; %2,0 karışık karbür; kalanı WC | 1 - 2 µm orta tanecik boyu | Sertlik: HV_{30} 1400 | Katman sistemi: PVD TiAlTaN
Uygulama:
Islak işleme, orta kesme hızları için üniversal kalite

Kaliteler Hakkında Açıklama

CTPM225

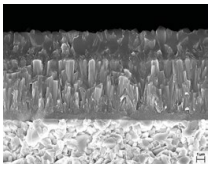
HC-P25 | **HC-M25**



Nitelikler:
Bileşim: %9,0 Co; %0,75 karışık karbür; kalanı WC | 0,7 - 1 µm küçük tanecik boyu | Sertlik: HV_{30} 1590 | Katman sistemi: PVD TiAlTaN
Uygulama:
Orta kesme hızları için kuru veya ıslak işleme
Malzeme örneği:
Östenitik, paslanmaz çelikler

CTCM235

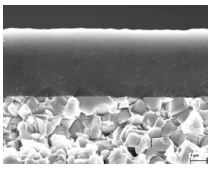
HC-P40 | **HC-M35**



Nitelikler:
Bileşim: %12,5 Co; %2,0 karışık karbür; kalanı WC | 1 µm küçük tanecik boyu | Sertlik: HV_{30} 1380 | Katman sistemi: CVD TiCN-Al_2O_3
Uygulama:
Orta kesme hızları için kuru işleme
Malzeme örneği:
Martensitik, paslanmaz çelikler

CTPM240

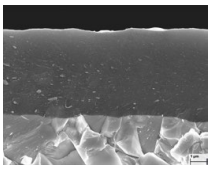
HC-P40 | **HC-M40**



Nitelikler:
Bileşim: %12,0 Co; %2,0 karışık karbür; kalanı WC | 1 µm küçük tanecik boyu | Sertlik: HV_{30} 1380 | Katman sistemi: PVD TiAlTaN
Uygulama:
Islak işleme, yüksek kesme hızları için üniversal kalite
Malzeme örneği:
Östenitik, paslanmaz çelikler

CTPM245

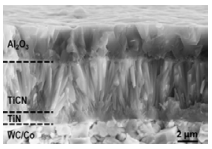
HC-P45 | **HC-M45**



Nitelikler:
Bileşim: %10,0 Co; %1,5 diğerleri; kalanı WC | 1 - 2 µm orta tanecik boyu | Sertlik: HV_{30} 1330 | Katman sistemi: PVD TiAlTaN
Uygulama:
Kuru veya ıslak işleme
Malzeme örneği:
Yüksek alaşımlı, martensitik ve östenitik paslanmaz çelikler

CTCM245

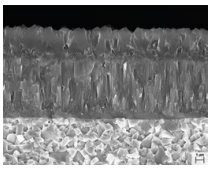
HC-P45 | **HC-M50** | HC-S35



Nitelikler:
Bileşim: %10,0 Co; %1,5 diğerleri; kalanı WC | 1 - 2 µm orta tanecik boyu | Sertlik: HV_{30} 1330 | Katman sistemi: CVD TiCN-Al_2O_3
Uygulama:
Kuru işleme
Malzeme örneği:
Yüksek alaşımlı, martensitik ve östenitik paslanmaz çelikler

CTCK215

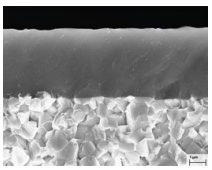
HC-K15



Nitelikler:
Bileşim: %6,0 Co; %2,0 karışık karbür; Kalanı WC | 1µm küçük tanecik boyu| Sertlik: HV_{30} 1630 | Katman sistemi: CVD TiCN-Al_2O_3
Uygulama:
Döküm malzemelerin yüksek kesme hızlarında kuru işlenmesi için özel kalite
Malzeme örneği:
GG25 ve GGG40 gibi döküm malzemeler

CTPK220

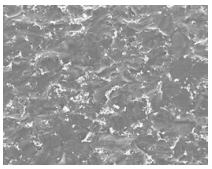
HC-K20



Nitelikler:
Bileşim: %6,0 Co; %2,0 karışık karbür; kalanı WC | 1 µm küçük tanecik boyu | Sertlik: HV_{30} 1630 | Katman sistemi: PVD TiAlTaN
Uygulama:
Döküm malzemelerin zorlu uygulama alanında ıslak işlenmesi için özel kalite
Malzeme örneği:
GGG50 ve GGG70 gibi yüksek mukavemetli döküm malzemeler

CTD4205

DP-N05

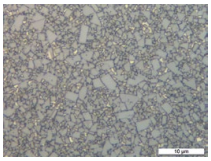


Nitelikler:
Bileşim: Şok kristalli elmas (PKD) | tanecik boyu 2-5µm | Katman sistemi: Kaplamasız
Uygulama:
Alüminyum ve demir dışı malzemelerin işlenmesi için
Malzeme örneği:
AlMgSi1 gibi demir dışı malzemeler

Kaliteler Hakkında Açıklama

CTWN215 (H216T)

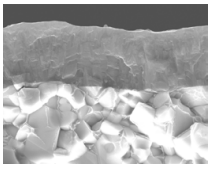
K15 | **N15** | O15



Nitelikler:
Bileşim: %6,0 Co; Kalanı WC | 1µm küçük tanecik boyu| Sertlik: HV_{30} 1650 | Katman sistemi: Kaplamasız
Uygulama:
Alüminyum ve demir dışı malzemelerin işlenmesi için kaplamasız karbür
Malzeme örneği:
AlMgSi1 gibi demir dışı malzemeler

CTPX715

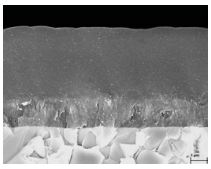
ISO | **P15** | **M15** | K15 | **N15** | **S20** | O10



Nitelikler:
Bileşim: %6,0 Co; Kalanı WC | 1µm küçük tanecik boyu| Sertlik: HV_{30} 1650 | Katman sistemi: PVD AlTiN
Uygulama:
Alüminyum ve demir dışı malzemelerin işlenmesi için
Malzeme örneği:
GGG30 döküm veya AlMgSi1 gibi demir dışı malzemeler

CTC5240

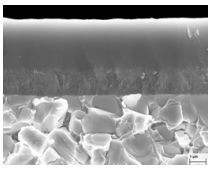
HC-S40



Nitelikler:
Bileşim: %10,0 Co; Kalanı WC | 2µm orta tanecik boyu| Sertlik: HV_{30} 1330 | Katman sistemi: CVD TiN-TiB_2
Uygulama:
Titanyum malzemeleri kuru işlemek için özel kalite
Malzeme örneği:
Ti6Al4V titanyum

CTCS245

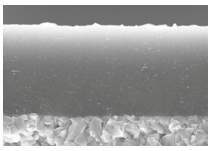
HC-S45



Nitelikler:
Bileşim: %12,0 Co; %1,8 karışık karbür; kalanı WC | 1 - 2 µm orta tanecik boyu | Sertlik: HV_{30} 1260 | Katman sistemi: CVD TiN-TiB_2
Uygulama:
Nikel bazlı alaşımların ıslak işlenmesi veya östenitik, paslanmaz çeliklerin kuru işlenmesi için özel kalite
Malzeme örneği:
Inconel, Rene, Nimonic, ... gibi ısıya dayanıklı malzemeler

CTP6215

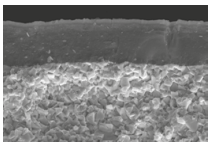
HC-H15 | **HC-K15**



Nitelikler:
Bileşim: %12,0 Co, Kalanı WC | 0,4µm çok küçük tanecik boyu| Sertlik: HV_{30} 1630 | Katman sistemi: PVD TiAlN
Uygulama:
400HB / 1300 N/mm^2 yüksek mukavemetli martensitik takım çeliklerinin işlenmesi için
Malzeme örneği:
1.2379, 1.2312 takım çeliği

CTPK231

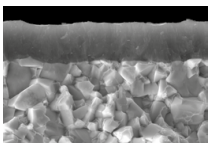
P30 | **M35** | **K30** | N30 | S35 | H30



Nitelikler:
Bileşim: %9,8 Co; kalanı WC | 1µm küçük tanecik boyu | Sertlik: HV_{30} 1612 | Katman sistemi: PVD TiN / TiAlN / ZS / TiAlN / Al_2O_3 / TiN
Uygulama:
Kuru işleme, çelik ve dökme demir malzemelerden orta ve kaba talaş kaldırma için dayanıklı karbür çeşidi

CTPP216

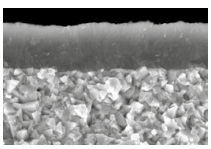
P10 | M20 | **K15** | N15 | S20 | **H15** | O15



Nitelikler:
Bileşim: %9,6 Co; Kalanı WC | 0,7-1µm küçük tanecik boyu| Sertlik: HV_{30} 1824 | Katman sistemi: PVD TiN / TiAlN / DS
Uygulama:
Yüksek mukavemetli malzemeler, alaşımsız takım çelikleri, 54 HRC'ye kadar sertleştirilmiş çelik ve dökme demirin işlenmesi için yüksek kesici kenar kararlılığına sahip, aşınmaya çok dayanıklı karbür kalitesi

CTPK226

P10 | M20 | **K15** | H15

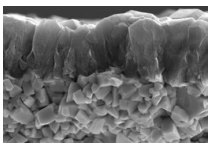


Nitelikler:
Bileşim: %11,6 Co; Kalanı WC | 0,7-1µm küçük tanecik boyu| Sertlik: HV_{30} 1711 | Katman sistemi: PVD TiN / AlTiN / DS
Uygulama:
62 HRC'ye kadar sertleştirilmiş çelik ve dökme demir malzemelerin işlenmesi için aşınmaya çok dayanıklı, ultra ince taneli karbür kalitesi

Kaliteler Hakkında Açıklama

CTCN211

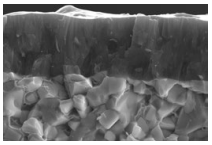
N10 | **O15**



Nitelikler:
Bileşim: %6,5 Co; Kalanı WC | 0,7-1µm küçük tanecik boyu| Sertlik: HV_{30} 1827 | Katman sistemi: PVD elmas
Uygulama:
Grafit ve demir dışı metallerin işlenmesi için elmas kaplamalı karbür kalitesi

WAN1240

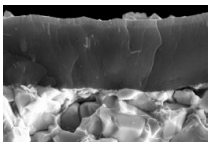
P40 | M35 | K30



Nitelikler:
Bileşim: %9 Co; %3,8 karışık karbür; kalanı WC | 1-2µm orta tanecik boyu | Sertlik: HV_{30} 1449 | Katman sistemi: PVD TiAlN / TiN
Uygulama:
Çeliğin orta ile yüksek kesme hızı aralığında işlenmesi için dayanıklı özel kalite, ek uygulamalarda dökme demirin işlenmesi için de uygundur

WAN2225

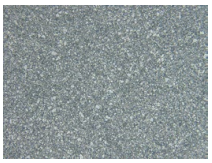
M25 | **S25**



Nitelikler:
Bileşim: %11,3 Co; Kalanı WC | 2µm orta tanecik boyu| Sertlik: HV_{30} 1307 | Katman sistemi: PVD TiAlN / TiN
Uygulama:
Islak ve kuru işleme, yüksek tokluk ve sıcaklık dayanımına sahip küçük tanecikli kalite. Paslanmaz ve aside dirençli çeliklerin kaba ve finiş işlenmesi için

WUN4210

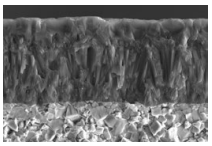
K15 | **N10** | O10



Nitelikler:
Bileşim: %8,1 Co; Kalanı WC | 0,7-1µm küçük tanecik boyu| Sertlik: HV_{30} 1715 | Katman sistemi: Kaplamasız
Uygulama:
Alüminyum ve demir dışı malzemelerin işlenmesi için kaplamasız karbür
Malzeme örneği:
AlMgSi1 gibi demir dışı malzemeler

WAX1240

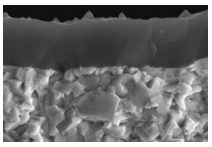
P40 | M25 | K30



Nitelikler:
Bileşim: %10,5 Co; %2,1 karışık karbür; kalanı WC | 1-2µm orta tanecik boyu | Sertlik: HV_{30} 1345 |
Katman sistemi: CVD TiN / TiCN / TiN / Al_2O_3
Uygulama:
Orta kesme hızında ve son derece yüksek diş başı ilerlemelerde çelikten orta ve kaba talaş kaldırma için çok yüksek mukavemetli özel kalite

WTN1205

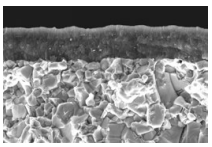
P10 | M15 | **K05** | **H10**



Nitelikler:
Bileşim: %7,3 Co; Kalanı WC | 0,7-1µm küçük tanecik boyu| Sertlik: HV_{30} 1801 | Katman sistemi: PVD TiN / TiAlN
Uygulama:
Çelik, sertleştirilmiş çelik ve dökme demirin yanı sıra demir dışı metaller ve grafitin işlenmesi için özel kalite

CTPP231

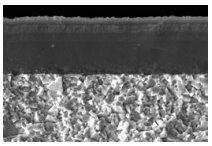
P30 | K25



Nitelikler:
Bileşim: %9,5 Co; %2 karışık karbür; kalanı WC | 2-3µm orta tanecik boyu | Sertlik: HV_{30} 1400 | Katman sistemi: PVD TiAlN
Uygulama:
Orta kesme hız aralığında, son derece yüksek ilerleme hızlarında çelikten orta ve kaba talaş kaldırma için dayanıklılığı çok yüksek özel kalite

CTPP211

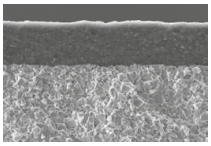
P10 | M15 | K10 | N10 | S15 | H10 | O10



Nitelikler:
Bileşim: %6,3 Co; Kalanı WC | 0,7-1µm küçük tanecik boyu| Sertlik: HV_{30} 1843 |
Katman sistemi: PVD TiN / TiAlN / ZS / TiAN / Al_2O_3 / ZS / TiN
Uygulama:
orta kesme hızları için üniversal kalite

Kaliteler Hakkında Açıklama

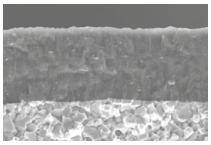
CTPP236



P35 | M35 | K30

Nitelikler:
Bileşim: %9,5 Co; %2 karışık karbür; kalanı WC | 2-3µm orta tanecik boyu | Sertlik: HV_{30} 1370 | Katman sistemi: PVD TiAlN
Uygulama:
Yüksek kesme hız aralığında çeliğin orta ve kaba talaşlı işlenmesi için dayanıklı özel kalite, ek uygulamalarda dökme demir ve paslanmaz çeliğin işlenmesi için de uygundur

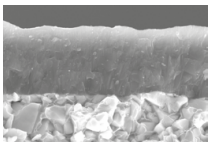
CTPK221



P15 | **K10**

Nitelikler:
Bileşim: %6 Co; kalanı WC | 1µm orta tanecik boyu | Sertlik: HV_{30} 1600 | Katman sistemi: PVD TiAlN
Uygulama:
Orta kesme hızında, dökme demir ve demir dışı metallerden ince talaş kaldırma için kaplamalı standart kalite

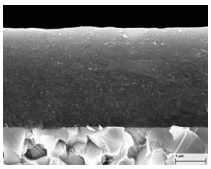
CTPM241



P40 | **M40** | S40

Nitelikler:
Bileşim: %12 Co; kalanı WC | 1-2µm orta tanecik boyu | Sertlik: HV_{30} 1450 | Katman sistemi: PVD TiAlN
Uygulama:
Paslanmaz ve ısıya dayanıklı çeliklerin işlenmesi için dayanıklı özel kalite

CTP1340

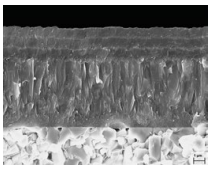


ISO | **P30** | **K30** | N30 | **S30** | O30

Özellikler:
Bileşim: %9,0 Co; %0,75 karışık karbürler; kalanı WC | Tanecik boyu: 0,7-1 µm | Sertlik: HV_{30} 1590 | Katman sistemi: PVD TiAlTaN

Kullanım tavsiyesi:
Çelik malzemeler, östenitik çelik, döküm malzemeler ve ısıya dayanıklı alaşımlar için üniversal kullanılabilen yüksek performanslı kalite.

CTCP335

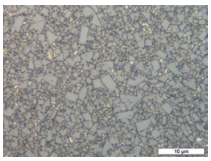


ISO | **P35** | M30 | **K35**

Özellikler:
Bileşim: %10,5 Co; %1,9 karışık karbürler; kalanı WC | Tanecik boyu: 1 µm | Sertlik: HV_{30} 1370 |
Katman sistemi: CVD TiCN-Al_2O_3 Çok katmanlı

Kullanım tavsiyesi:
Çelik ve döküm malzemelerin işlenmesi için güvenilir seçim.

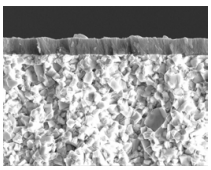
CWK10



N10 | O10

Nitelikler:
Bileşim: %6,0 Co; Kalanı WC | 1µm küçük tanecik boyu| Sertlik: HV_{30} 1650 | Katman sistemi: Kaplamasız
Uygulama:
Alüminyum ve demir dışı malzemelerin işlenmesi için kaplamasız karbür
Malzeme örneği:
AlMgSi1 gibi demir dışı malzemeler

CWX500



ISO | **P30** | **M30** | **K35** | **N35** | **S15** | H05 | **O10**

Özellikler:
Bileşim: %10,0 Co; %0,7 sair; kalanı WC | Tanecik boyu: 1 µm | Sertlik: HV_{30} 1660

Kullanım tavsiyesi:
Tüm malzemeler için evrensel karbür kalitesi

Kaliteler Hakkında Açıklama

