

KESİCİ TAKIMLAR TORNA



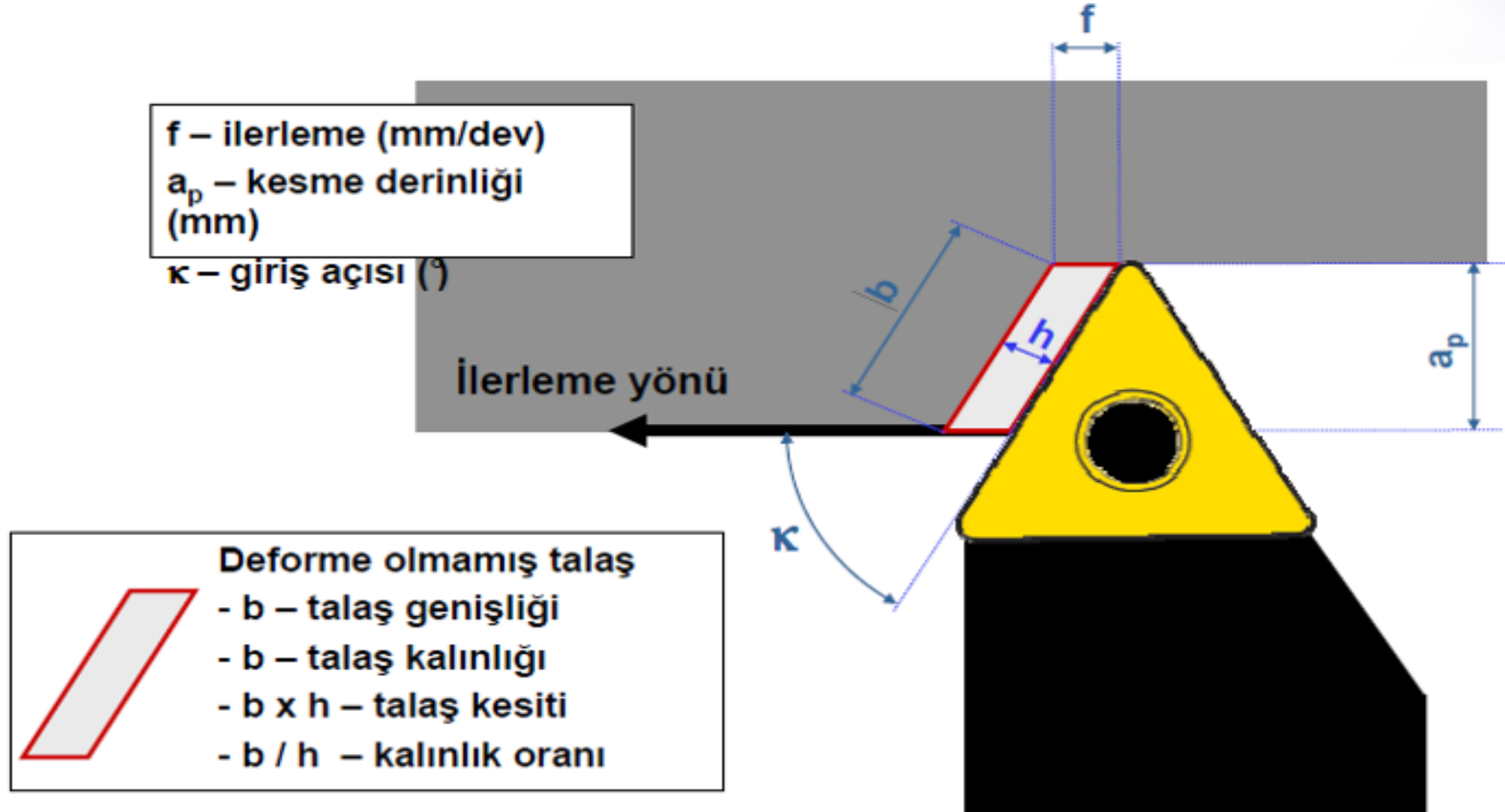
Tornalama için kesme koşulları

Kesme koşullarının seçimi



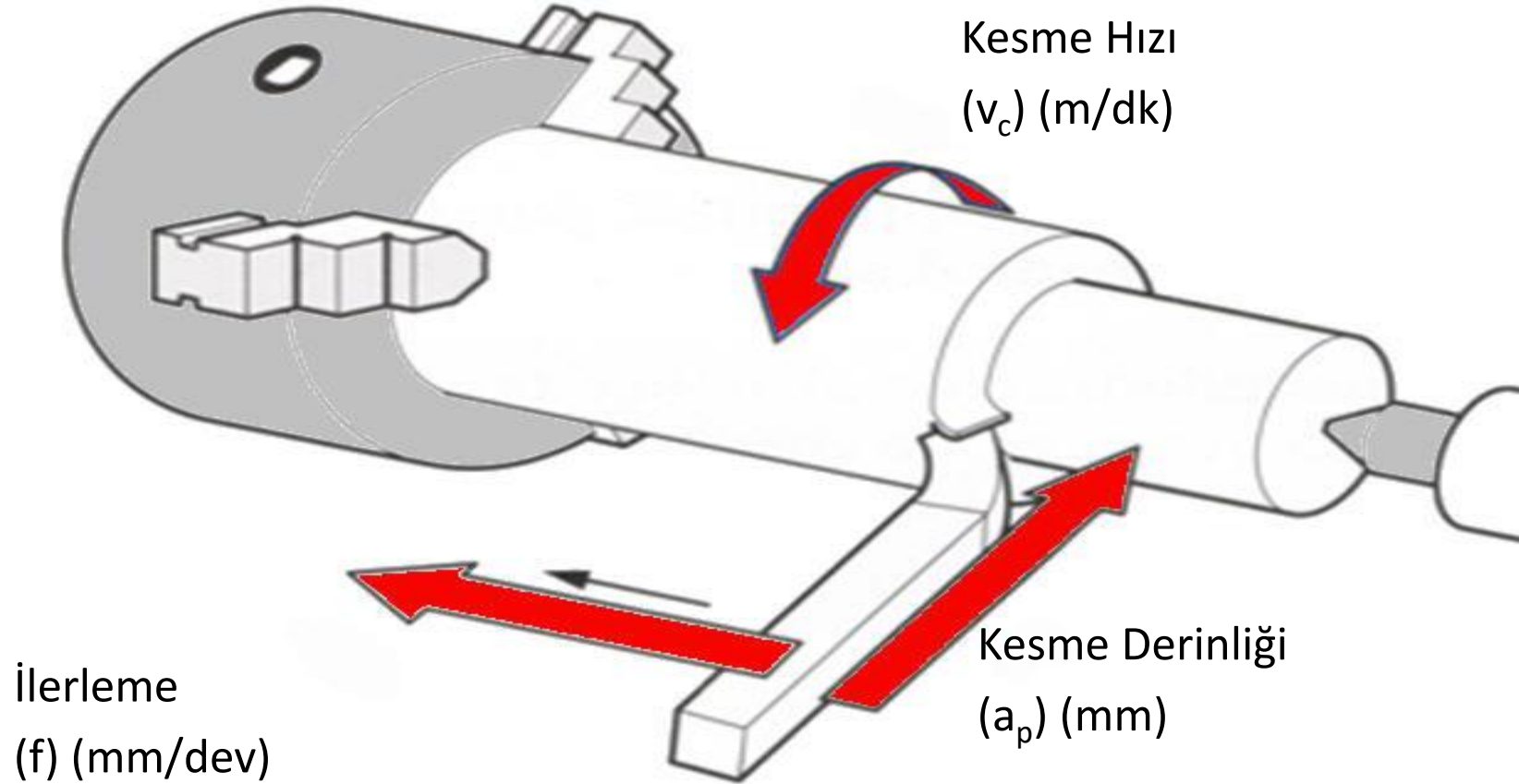
METAL KESMEYİ ANLAMA

Geometrik Kesme Koşulları



Metal kesmeyi anlama

Kesme parametreleri



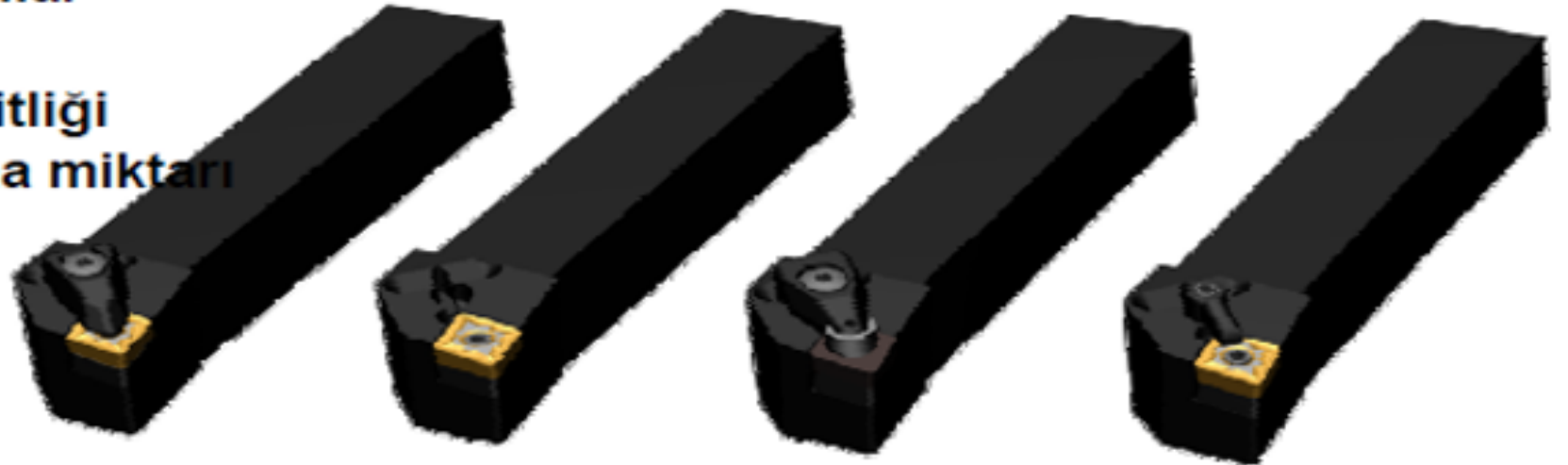


İŞLENEBİLİRLİK

Takım tutucular

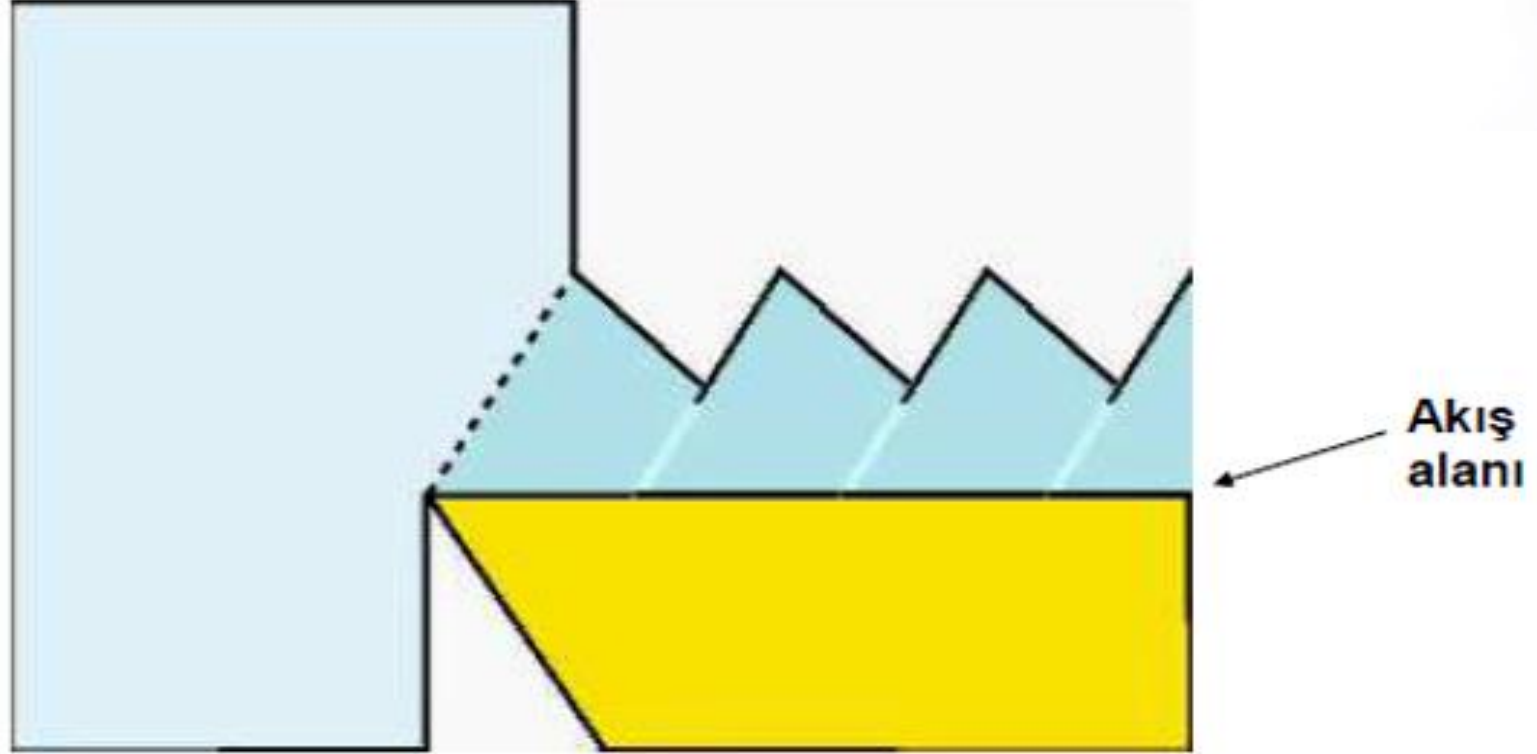
- Uygulama için en iyi tipi seçin

- Termal dayanım
- Sağlamlık
- Uç değiştirme süresi
- Değişkenlik
- Kombinasyonlar
- Hassasiyet
- Kullanım basitliği
- Talaş kaldırma miktarı





TALAŞ OLUŞUMU



Uzun talaşlı malzemeleri alt tarafta akış bölgesine sahiptir. Akış bölgesinin kalınlığı iş parçası malzemesinden, yanaşma açısından ve kesme hızından etkilenir.



TALAŞ OLUŞUMU



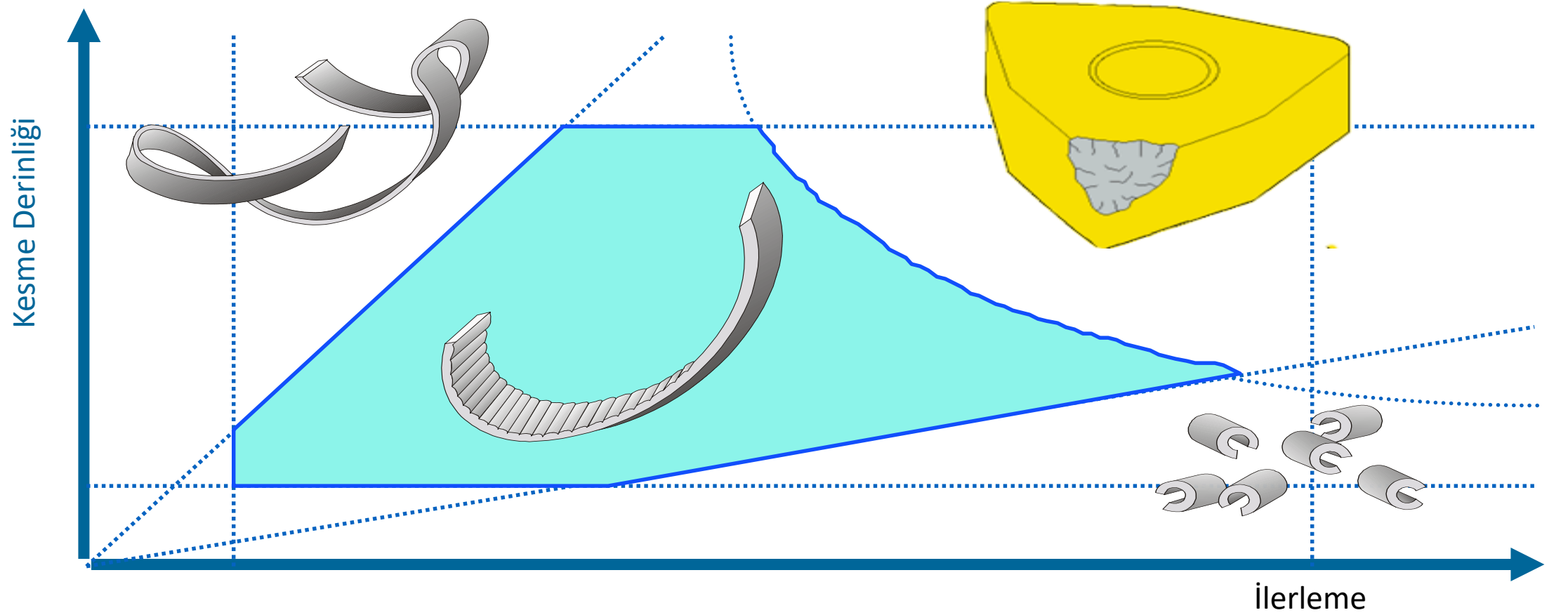
Talaş oluşumunu etkileyen faktörler



Takım	Kesme koşulları	Malzeme	Soğutma sıvısı
Boşluk açısı Giriş açısı Radyüs Kaplama Kesme kenarı ve talaş kırıcı geometrisi	İlerleme Kesme derinliği Talaş kalınlık oranı Kesim hızı	Sertlik Çekme dayanıklılığı Termal işlem Yapı	Kuru işleme Emülsiyon soğutma Kesme yağı

Talaş oluşumu

Talaş kırıcı diyagramı



Kesme kuvvetleri ve talaş şekli, kesme derinliği ve uç geometrisi tarafından belirlenir.



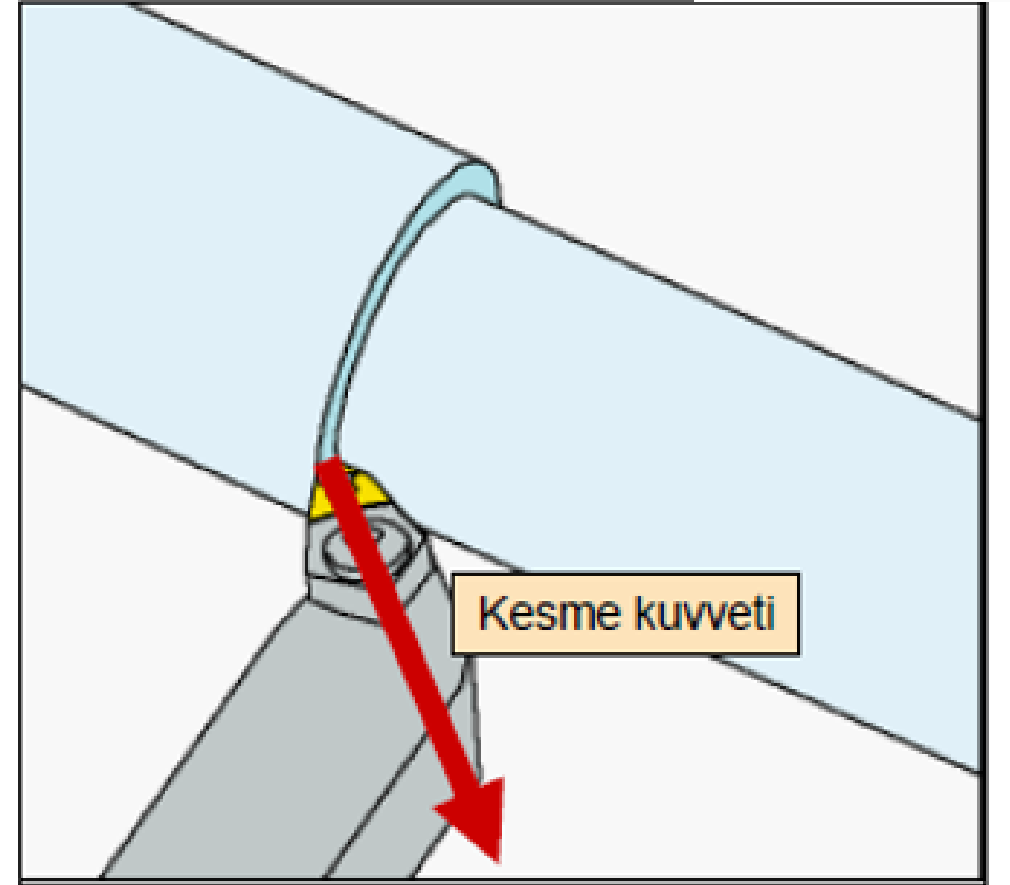
KESME KUVVETLERİ

Kesme kuvvetini etkileyenler:

- İş parçası malzemesi
- Takım geometrisi
- Kesme verisi

Kesme kuvvetinin etkiledikleri:

- Güç tüketimi
- Vibrasyonlar (örn. iş parçası deformasyonu, toleranslar)
- Takım ömrü

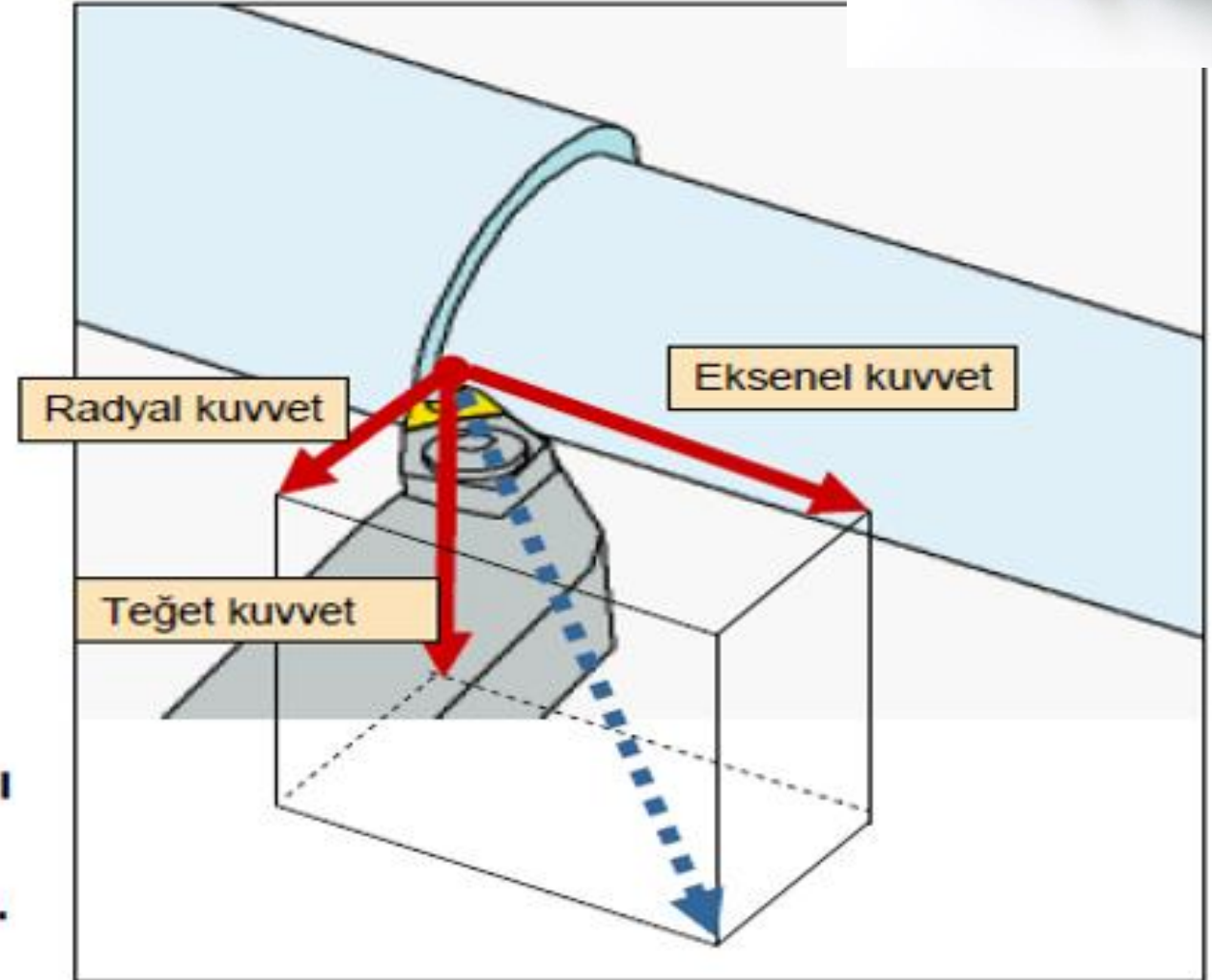




KESME KUVVETLERİ



- Kesme kuvveti aşağıdakilerin toplamıdır:
 - Eksenel kuvvet bileşeni
 - Radyal kuvvet bileşeni
 - Teğet kuvvet bileşeni
- Teğet kuvvet güç tüketimini belirler.
- Teğet ve radyal kuvvet bileşenlerinin kombinasyonu olası vibrasyonların ve iş parçası deformasyonlarının ana sebebidir.



P	Alaşımsız çelik ve dökme çelik Düşük alaşımlı çelik ve dökme çelik Yüksek alaşımlı çelik ve dökme çelik Paslanmaz çelik ve dökme çelik (fer/mar)	< 600 N/mm ² < 900 N/mm ² > 900 N/mm ² < 750 N/mm ²
M	Paslanmaz çelik (ostenit)	> 750 N/mm ²
K	Gri dökme demir Dövülebilir dökme demir Nodüler dökme demir (ferit/perlit)	
N	Demir içermeyen metaller Alüminyum ve alüminyum alaşımları	
S	Süper alaşımlar Titanyum ve titanyum alaşımları	
H	Sert dökme demir Sertleştirilmiş çelik	> 60 HRC > 45 HRC

C N M G 12 04 08

C



80°

S



90°

D



55°

T



60°

K



55°

V



35°

R



--

W



80°

C N M G 12 04 08

m

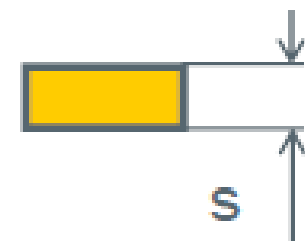
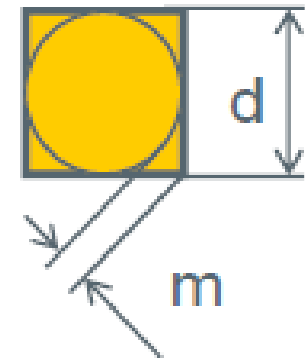
s

d

G ± 0.025 ± 0.13 ± 0.025

M ± 0.08 to ± 0.2 ± 0.13 ± 0.05 to ± 0.15

U ± 0.13 to ± 0.38 ± 0.13 ± 0.08 to ± 0.25



C N M G 12 04 08

A



Without chip breaker,
with cylindrical fixation hole

R



Chip breakers at one side,
without conical fixation hole

W



Without chip breaker,
With conical fixation hole

G



Chip breakers at both sides,
with cylindrical fixation hole

T



Chip breakers at one side,
with conical fixation hole

X



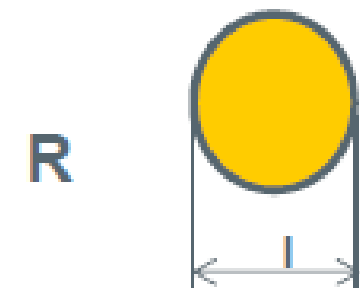
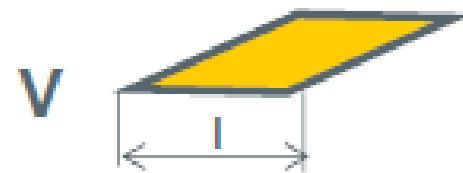
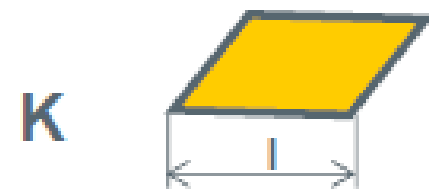
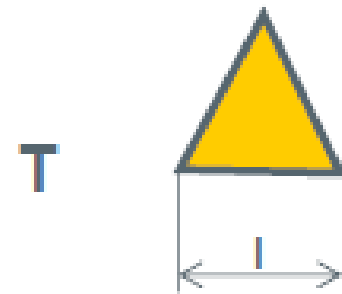
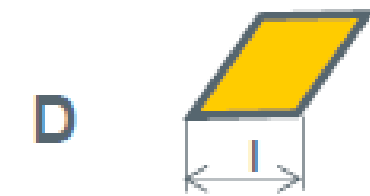
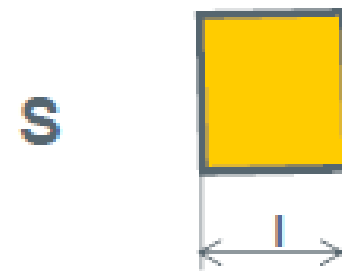
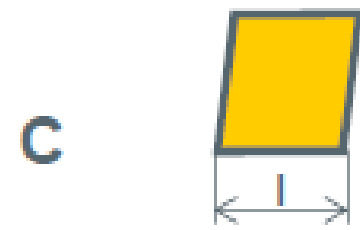
With special features
according to drawing

M



Chip breakers at one side,
with cylindrical fixation hole

C N M G 12 04 08



W

06 = 6.350 mm

09 = 9.525 mm

11 = 11.000 mm

12 = 12.700 mm

15 = 15.880 mm

16 = 16.500 mm

19 = 19.050 mm

22 = 22.000 mm

25 = 25.400 mm

27 = 27.500 mm

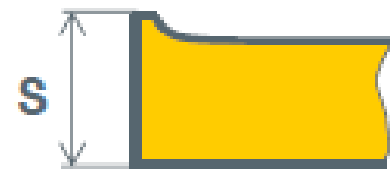
33 = 33.000 mm

C N M G 12 04 08



01 = 1.59 mm

05 = 5.56 mm



T1 = 1.98 mm

06 = 6.35 mm

02 = 2.38 mm

07 = 7.94 mm

03 = 3.18 mm

09 = 9.52 mm

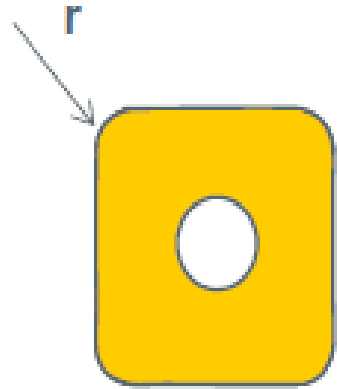


T3 = 3.97 mm

12 = 12.7 mm

04 = 4.76 mm

C N M G 12 04 08



00 = max. 0.2 mm

20 = 2.0 mm $\pm$ 0.1

04 = 0.4 mm $\pm$ 0.1

24 = 2.4 mm $\pm$ 0.1

08 = 0.8 mm $\pm$ 0.1

25 = 2.5 mm $\pm$ 0.1

12 = 1.2 mm $\pm$ 0.1

30 = 3.0 mm $\pm$ 0.1

16 = 1.6 mm $\pm$ 0.1

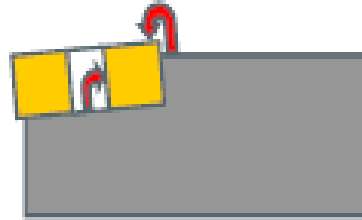
Özel yuvarlak uçlar için 00 „Zero Zero“ Inch ölçüsüne çevrilmiş

M0 „M Zero“ mm

e.g. RCGT 0803M0 $\Rightarrow$ d = 8.00 mm

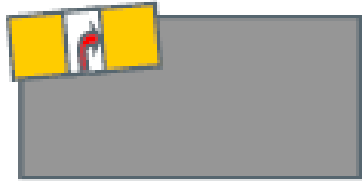
P C L N R 25 25 M 12

M



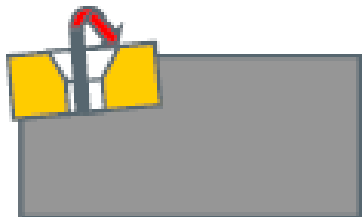
Delik içi çekirme ve üstten bağlama

P



Delik içi çekirme ile bağlama

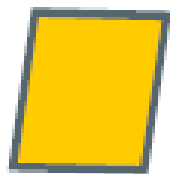
S



Civata ile bağlama

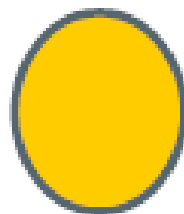
P C L N R 25 25 M 12

C



80°

R



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V



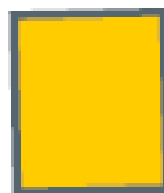
35°

D



55°

S



90°

W



80°

K



55°

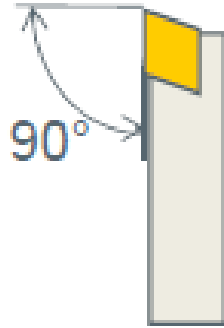
T



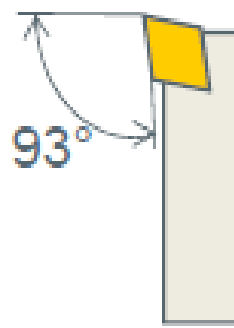
60°

P C L N R 25 25 M 12

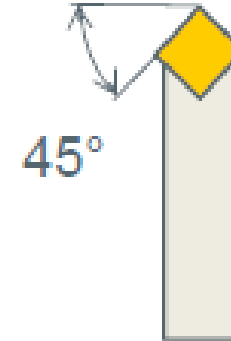
C



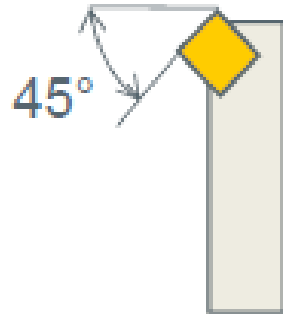
J



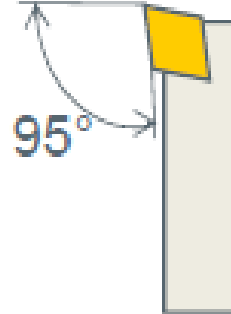
S



D

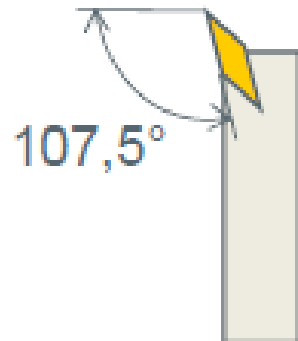


L

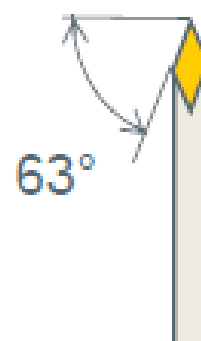


... Daha fazla detay için torna kataloguna bakınız!

H

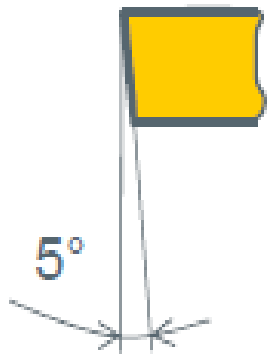


N

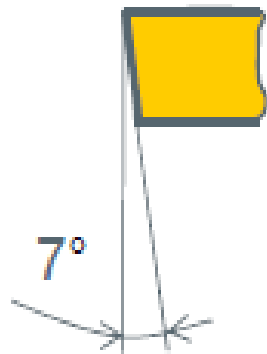


P C L N R 25 25 M 12

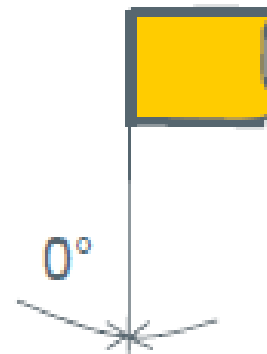
(B)



C



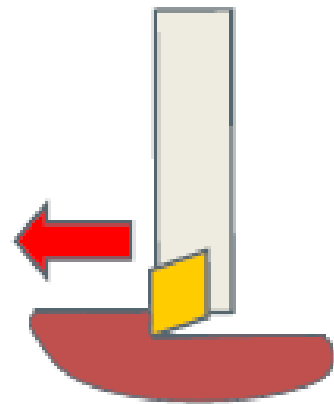
N



P C L N R 25 25 M 12

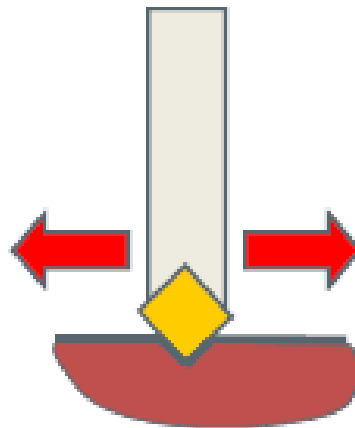
L

Sol yönlü kesme



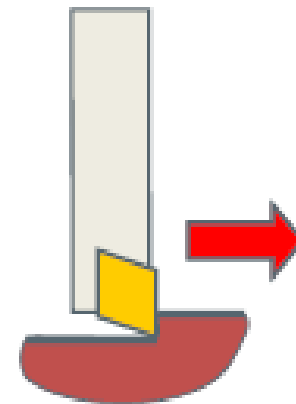
N

Sağ ve sol yönlü kesme

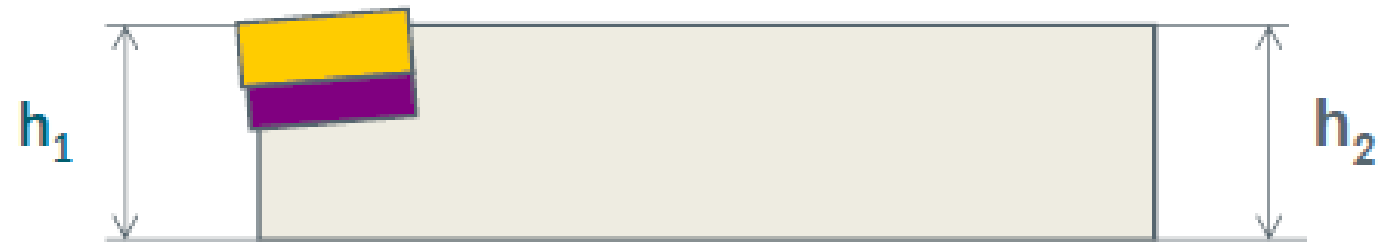


R

Sağ yönlü kesme

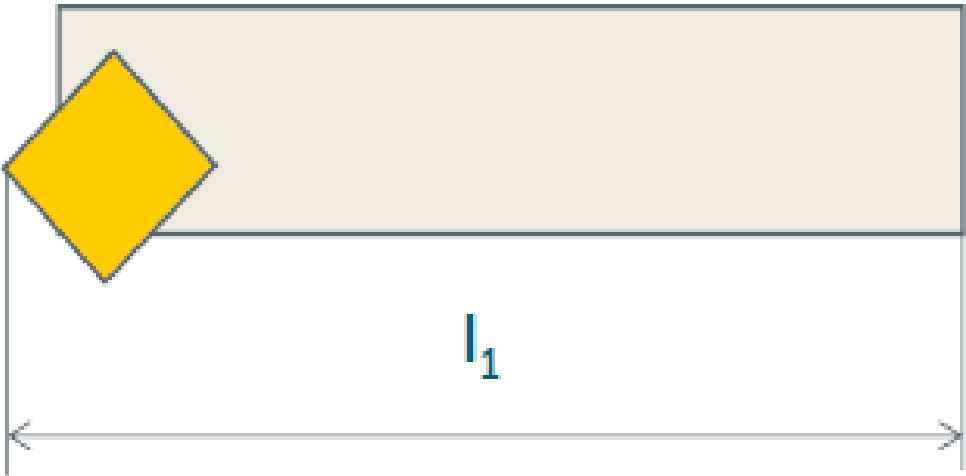


P C L N R **25** 25 M 12



Şaft yüksekliği h_2 , kesme yüksekliği h_1

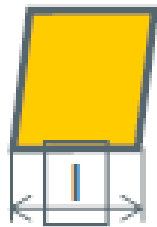
P C L N R 25 25 M 12



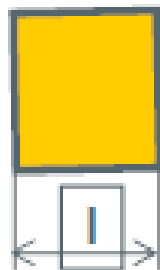
A	=	32 mm	N	=	160 mm
B	=	40 mm	P	=	170 mm
C	=	50 mm	Q	=	180 mm
D	=	60 mm	R	=	200 mm
E	=	70 mm	S	=	250 mm
F	=	80 mm	T	=	300 mm
G	=	90 mm	U	=	350 mm
H	=	100 mm	V	=	400 mm
J	=	110 mm	W	=	450 mm
K	=	125 mm	X	=	sonder
L	=	140 mm	Y	=	500 mm
M	=	150 mm			

P C L N R 25 25 M 12

C



S



06 = 6.350 mm

09 = 9.525 mm

11 = 11.000 mm

12 = 12.700 mm

15 = 15.880 mm

16 = 16.500 mm

19 = 19.050 mm

22 = 22.000 mm

25 = 25.400 mm

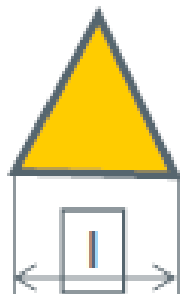
27 = 27.500 mm

33 = 33.000 mm

D



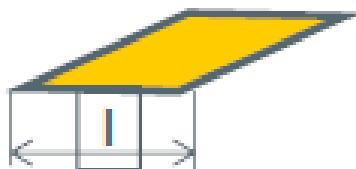
T



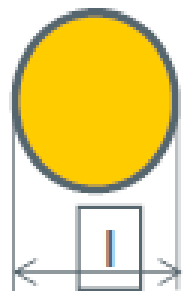
K



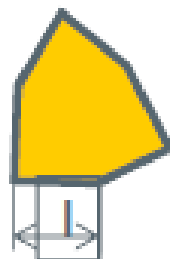
V



R



W



S 32 T P C L N R 12

S

Çelik şaft

İçten soğutma yok

A

Çelik şaft

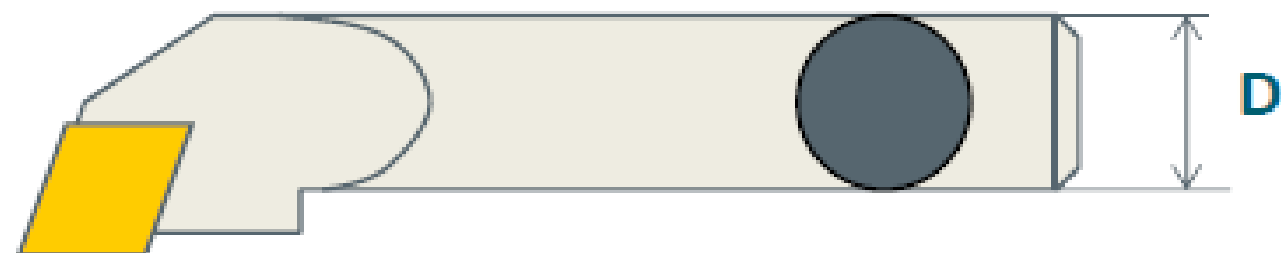
İçten soğutma var

E

Karbür şaft(Çelik gövde)

İçten soğutma var

S 32 T P C L N R 12



08 25

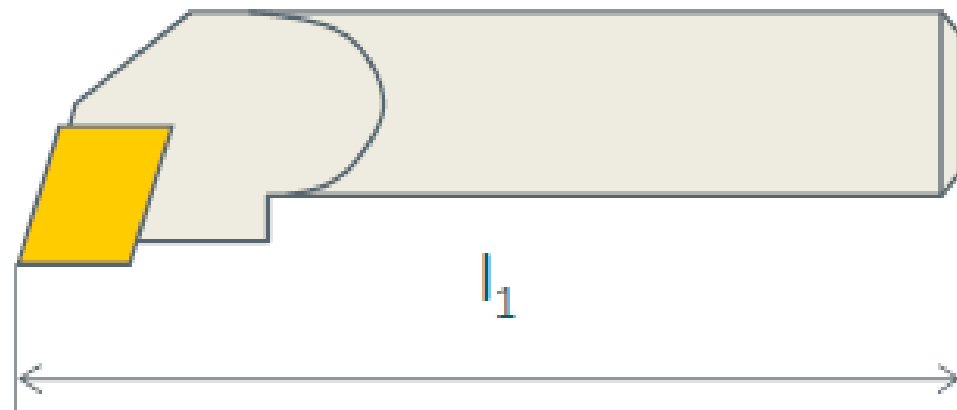
10 32

12 40

16 50

20

S 32 **I** P C L N R 12



$$A = 32 \text{ mm}$$

$$G = 90 \text{ mm}$$

$$B = 40 \text{ mm}$$

$$H = 100$$

$$C = 50 \text{ mm}$$

$$\text{mm}$$

$$D = 60 \text{ mm}$$

$$J = 110$$

$$E = 70 \text{ mm}$$

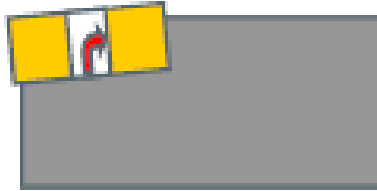
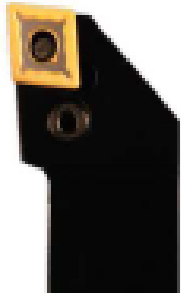
$$\text{mm}$$

$$F = 80 \text{ mm}$$

$$K = 125$$

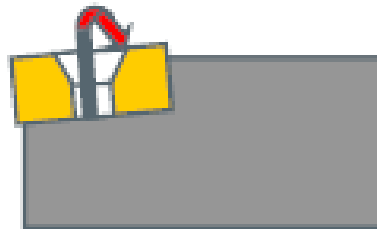
S 32 T P C L N R 12

P



Delik içinden çekirme ile

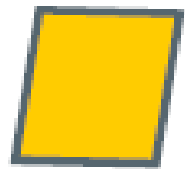
S



Civata ile sıkma

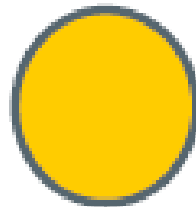
S 32 T P C L N R 12

C



80°

R



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V



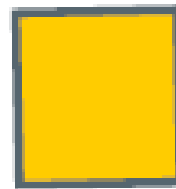
35°

D



55°

S



90°

W



80°

K



55°

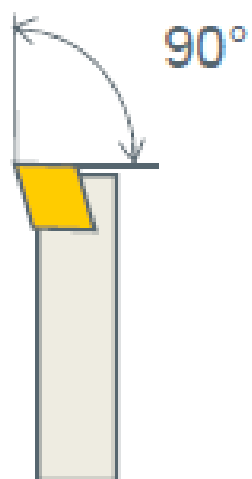
T



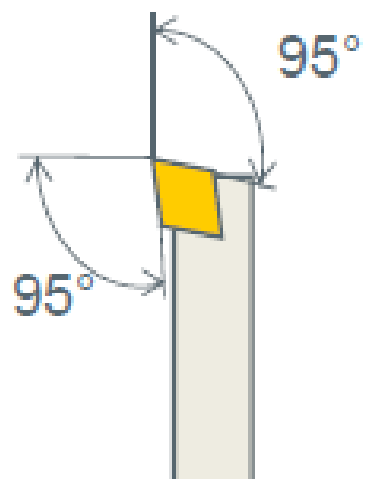
60°

S 32 T P C L N R 12

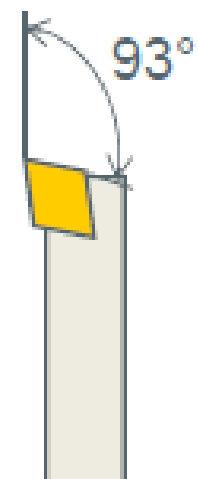
F



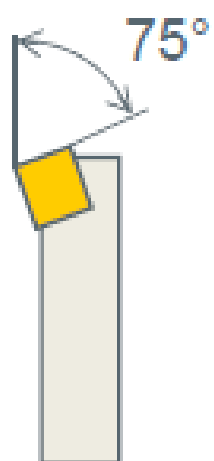
L



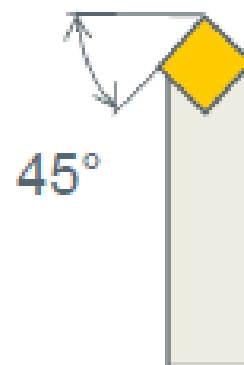
U



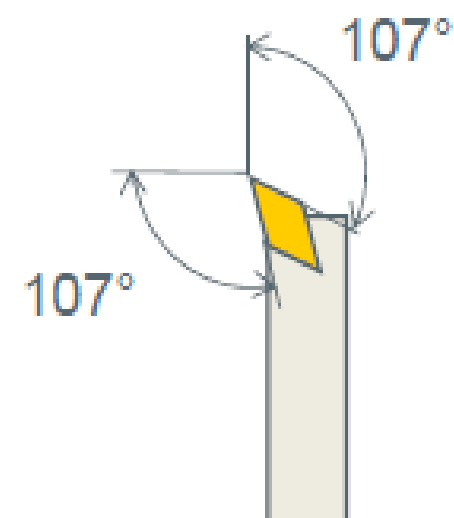
K



S

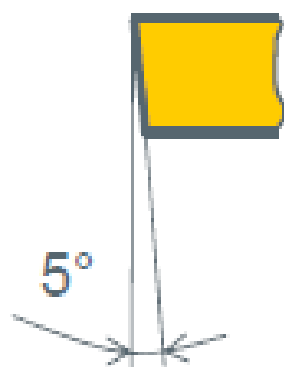


Q

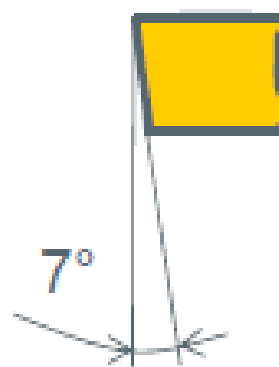


S 32 T P C L N R 12

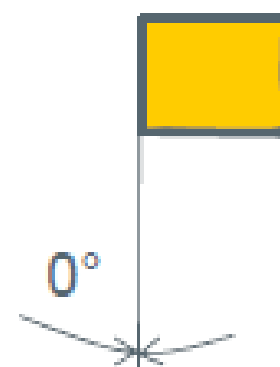
(B)



C



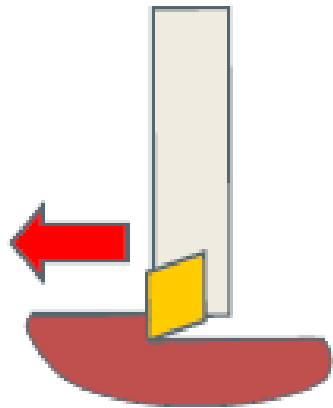
N



S 32 T P C L N R₁₂

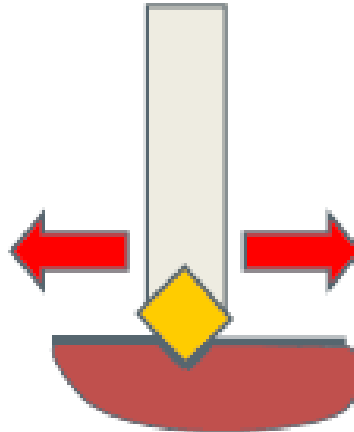
L

Sol yönlü kesme



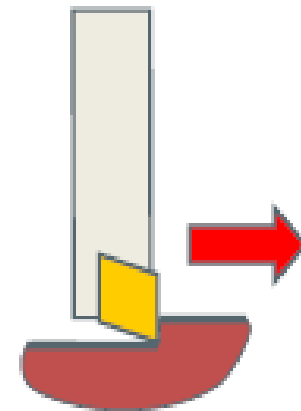
N

Sağ ve sol yönlü kesme



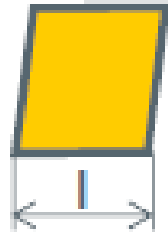
R

Sağ yönlü kesme

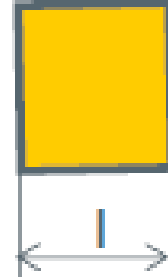


S 32 T P C L N R 12

C



S

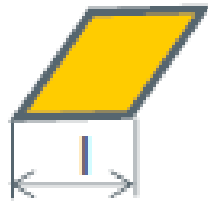


06 = 6.350 mm

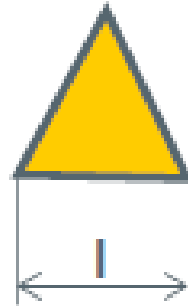
09 = 9.525 mm

11 = 11.000 mm

D



T

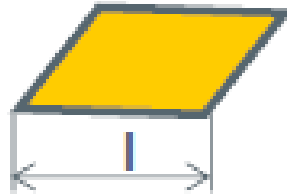


12 = 12.700 mm

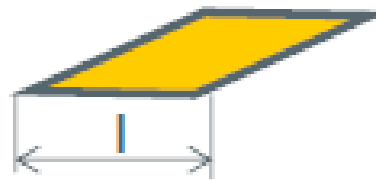
15 = 15.880 mm

16 = 16.500 mm

K



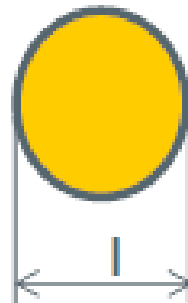
V



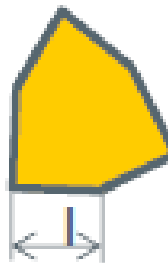
19 = 19.050 mm

22 = 22.000 mm

R



W



25 = 25.400 mm

27 = 27.500 mm

33 = 33.000 mm