QWIKREAM™

Diameter range:
.4528"-1.2600" (11.5mm-32.00mm)

Head Series:
XSA-straight flute/blind hole
XLB-LH flute/thru hole

Shank series:
.625", .750", 1.25" cylindrical
16mm, 20mm, 32mm cylindrical

Length/Diameter ratio:
1.5 x D NEW
3 x D
5 x D
8 x D

HIGH SPEED INDEXABLE REAMING SYSTEM

UPDATED PRODUCT ANNOUNCEMENT 2017

Indexable high speed reaming system known as QwikReam allows the ability to ream diameters ranging from .4528"-1.2600" (11.5mm-32.00mm) for both blind hole and thru hole applications. Coolant thru capabilities combined with multiple flute head design, allows for 30-40 times higher feed rates when compared to conventional reaming resulting in major reduction of cycle times.

QwikReam system consists of a 3 piece, patented indexing mechanism that includes a toolholder/shank, bayonet screw and replaceable reaming head. Heads can be indexed/replaced while still mounted in the machine or arbor resulting in virtually ZERO set up time and also reducing the risk of components being dropped or lost during indexing/replacing.

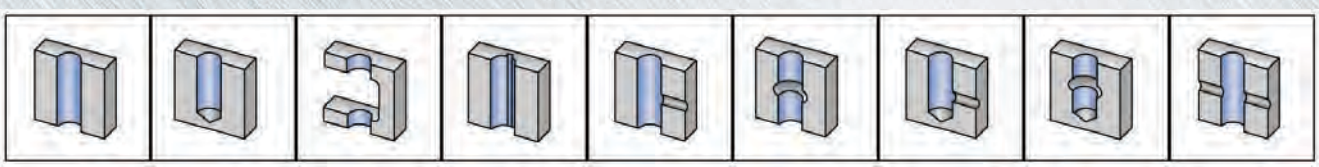
Member IMC Group Ingersoll Cutting Tools

QWIKREAM™ APPLICATION RANGE

The QwikReam system is designed for high speed reaming. In comparison to the conventional method, this advanced solution allows increasing the feeds dramatically (more than 30 times faster). This feature is most advantageous in mass production industries. When large quantities of workpieces are involved, the savings in machining time, labor cost and productivity are multiplied greatly.

The QwikReam system is more expensive when compared to a conventional reamer. However, due to its high productivity, shorter production time and elimination of setup time, the tool cost per part is significantly lower.

QWIKREAM™ BORE TYPES



The QwikReam can be used for blind and through holes as well as for holes with cross holes or keyways. Moreover, they can be used for a very wide range of workpiece materials. Attached is a table with recommended machining data.

QWIKREAM™ ADVANTAGES

- High speed/high production.
- No setup time.
- Low runout (maximum 3µm).
- One shank can be used for a range of hole diameters and various types of cutting edges.
- Durable, due to the combination of a carbide head and steel shank.
- No fear of losing any clamping parts which may fall during indexing.
- Internal coolant directed optimally to the cutting edges.
- Possibility of applying Minimal Quantity Lubrication (MQL) systems.
- No need to remove the tool, due to the frontal indexing system.

QWIKREAM™ GUIDELINES FOR HIGH SPEED REAMING

As the cutting speed and feed are much higher than in conventional reaming, the following guidelines should be adhered to:

- The machine being used should be in good condition, meaning:
  - Very rigid, to minimize vibration and low runout
  - Equipped with an internal coolant spindle
- The reamers being used for high speed reaming are usually coated or made from PCD/CBN.
- Conventional reaming should be considered:
  - When the machine is not sufficiently rigid.
  - If only external cooling can be used.
  - In special applications such as thin walled tubes or when reaming soft materials (plastic, etc).
  - When there is a demand to use floating adapters (GFI).

QWIKREAM™ GRADES

The reaming heads are available in IN2005 grade which is a submicron substrate, TiAlN PVD coated. IN2005 is Ingersoll's most versatile grade, covering a wide range of workpiece materials and machining conditions. IN2005 features very high fracture and wear resistance which is required for efficient high speed reaming. A special coating process of the TiAlN PVD coating ensures very accurate and uniform coating thickness keeping a sharp cutting edge.

The following grades can be provided on request:

- PCD grade for machining aluminum
- PCBN grade for machining cast iron
- Cermet

PCD tip for machining aluminum

QWIKREAM™ REGRINDING

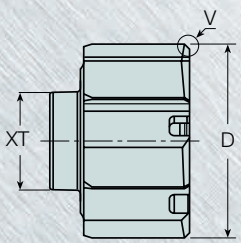
Regrinding the QwikReam head is not recommended since the high performance and repeatability will be affected. It is recommended to consider the QwikReam head as an indexable "disposable" insert.

QWIKREAM™ RANGE

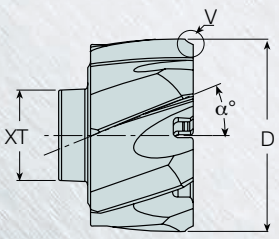
The standard QwikReam line will cover the range of .4528" - 1.2600" (11.500 - 32.000mm). There are 5 bayonet sizes with their corresponding bayonet screws and clamping keys covering this range.

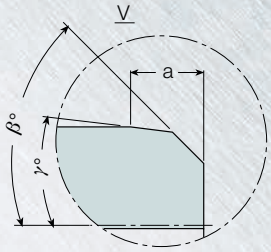
QWIKREAM™ REAMER HEAD DESIGNATION CODE KEY

Straight Flute



Left-Hand Flute





XL - B - 19 600 - R - 71 - IN2005

QwikReam Reamer

Flute Type
L = L.H.
S = Straight

Front End Configuration Code

Hole Diameter .4528" - 1.2600"
(11.500 - 32.000mm)

Right Hand Rotation

8 = H8 Tolerance
7 = H7 Tolerance
6 = H6 Tolerance

Deviation

Grade

QWIKREAM Range

D Range		XT Size
.4528" - .5315"	(11.500-13.500mm)	XT5
.5316" - .6299"	(13.501-16.000mm)	XT6
.6300" - .7874"	(16.001-20.000mm)	XT7
.7875" - 1.0000"	(20.001-25.400mm)	XT8
1.0001" - 1.2600"	(25.401-32.000mm)	XT9

Front End Configuration Code Key

Chamfer Type/Value	β°	γ°	a
A	45	-	.020"
B	25	-	.042"
C	45	8	.059"
D	30	4	.059"

Head Options

Flute Type	Flute Angle α°	β°	γ°	a	Front End Code	IT	Grade
Straight	0	45	-	.020"	*A	H7	IN05S
		45	8	.059"	C		IN2005*
Left-Hand	20	25	-	.042"	*B		PCD
		30	4	.059"	D		CBN

* Standard

QWIKREAM™ XT CONNECTION SIZES

– Each size has its own diameter range and holder types

XT5
Ø.4527" - .5314"
(11.500 - 13.500mm)

XT6
Ø.5315" - .6299"
(13.501 - 16.000mm)

XT7
Ø.6300" - .7874"
(16.001 - 20.000mm)

XT8
Ø.7875" - 1.0000"
(20.001 - 25.400mm)

XT9
Ø1.0001" - 1.2716"
(25.401 - 32.000mm)

QWIKREAM™ ALLOWANCE & FLUTE GEOMETRY BY HOLE TYPE

Reaming allowance is the machining stock removed by reaming which varies depending on the workpiece material and pre-hole quality.
Pre-hole should have good surface & straightness to optimize the hole quality when reaming.

Hole Diameter	.4528"-.531"	.5311"-.6299"	.6300"-1.2600"
Steel	.004"-.008"	.004"-.012"	.004"-.012"
Cast Iron	.004"-.008"	.004"-.012"	.004"-.012"
Aluminium	.006"-.010"	.008"-.012"	.008"-.012"

Left-Handed Flute (Through Hole)

Chips are pushed forward immediately after formation

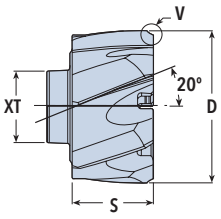
Straight Flute (Blind Hole)

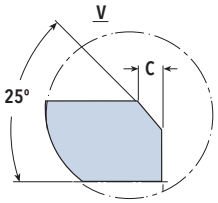
Coolant flow helps chip evacuation by directing formed chips backward.

- Straight flute heads can be used for through hole application for short chipping materials. (e.g. cast iron)

QWIKREAM™ XLB LEFT-HAND FLUTE HEADS

Left-Hand Flute



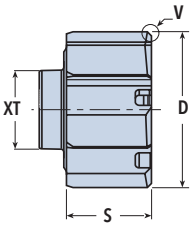


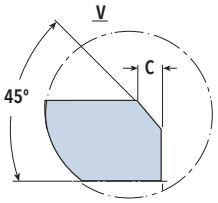
Designation	XT Connection	D (inch)	S (inch)	C (inch)	Flute Type	# of Flutes	Front End Code	Grade
XLB12700R71	XT5	0.5000	.366	.042	LH	6	B	IN2005
XLB14287R71	XT5	0.5625	.366	.042	LH	6	B	IN2005
XLB15875R71	XT6	0.6250	.370	.042	LH	6	B	IN2005
XLB17462R71	XT7	0.6875	.417	.042	LH	6	B	IN2005
XLB19050R71	XT7	0.7500	.417	.042	LH	6	B	IN2005
XLB20637R71	XT8	0.8125	.504	.042	LH	8	B	IN2005
XLB22225R71	XT8	0.8750	.504	.042	LH	8	B	IN2005
XLB23812R71	XT8	0.9375	.504	.042	LH	8	B	IN2005
XLB25400R71	XT8	1.0000	.504	.042	LH	8	B	IN2005
XLB31750R71	XT9	1.2500	.504	.042	LH	8	B	IN2005

Designation	XT Connection	D (mm)	S (mm)	C (mm)	Flute Type	# of Flutes	Front End Code	Grade
XLB11501R71	XT5	11.501	9.3	1.07	LH	6	B	IN2005
XLB12000R71	XT5	12.000	9.3	1.07	LH	6	B	IN2005
XLB13000R71	XT5	13.000	9.3	1.07	LH	6	B	IN2005
XLB13500R71	XT5	13.500	9.3	1.07	LH	6	B	IN2005
XLB13501R71	XT6	13.501	9.4	1.07	LH	6	B	IN2005
XLB14000R71	XT6	14.000	9.4	1.07	LH	6	B	IN2005
XLB15000R71	XT6	15.000	9.4	1.07	LH	6	B	IN2005
XLB16000R71	XT6	16.000	9.4	1.07	LH	6	B	IN2005
XLB16001R71	XT7	16.001	10.6	1.07	LH	6	B	IN2005
XLB17000R71	XT7	17.000	10.6	1.07	LH	6	B	IN2005
XLB18000R71	XT7	18.000	10.6	1.07	LH	6	B	IN2005
XLB19000R71	XT7	19.000	10.6	1.07	LH	6	B	IN2005
XLB20000R71	XT7	20.000	10.6	1.07	LH	6	B	IN2005
XLB20001R71	XT8	20.001	12.8	1.07	LH	8	B	IN2005
XLB21000R71	XT8	21.000	12.8	1.07	LH	8	B	IN2005
XLB22000R71	XT8	22.000	12.8	1.07	LH	8	B	IN2005
XLB23000R71	XT8	23.000	12.8	1.07	LH	8	B	IN2005
XLB24000R71	XT8	24.000	12.8	1.07	LH	8	B	IN2005
XLB25000R71	XT8	25.000	12.8	1.07	LH	8	B	IN2005
XLB26000R71	XT9	26.000	12.8	1.07	LH	8	B	IN2005
XLB27000R71	XT9	27.000	12.8	1.07	LH	8	B	IN2005
XLB28000R71	XT9	28.000	12.8	1.07	LH	8	B	IN2005
XLB29000R71	XT9	29.000	12.8	1.07	LH	8	B	IN2005
XLB30000R71	XT9	30.000	12.8	1.07	LH	8	B	IN2005
XLB31000R71	XT9	31.000	12.8	1.07	LH	8	B	IN2005
XLB32000R71	XT9	32.000	12.8	1.07	LH	8	B	IN2005

QWIKREAM™ XSA STRAIGHT FLUTE HEADS

Straight Flute

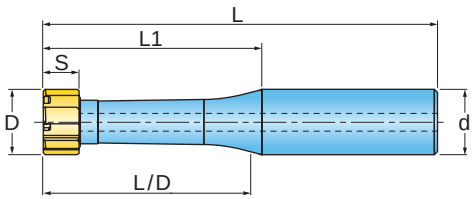




Designation	XT Connection	D (inch)	S (inch)	C (inch)	Flute Type	# of Flutes	Front End Code	Grade
XSA12700R71	XT5	0.5000	0.366	0.020	ST	6	A	IN2005
XSA14287R71	XT5	0.5265	0.366	0.020	ST	6	A	IN2005
XSA15875R71	XT6	0.6250	0.370	0.020	ST	6	A	IN2005
XSA17462R71	XT7	0.6875	0.417	0.020	ST	6	A	IN2005
XSA19050R71	XT7	0.7500	0.417	0.020	ST	6	A	IN2005
XSA20637R71	XT8	0.8125	0.504	0.020	ST	8	A	IN2005
XSA22225R71	XT8	0.8750	0.504	0.020	ST	8	A	IN2005
XSA23812R01	XT8	0.9375	0.504	0.020	ST	8	A	IN2005
XSA25400R71	XT8	1.0000	0.504	0.020	ST	8	A	IN2005
XSA31750R71	XT9	1.2500	0.504	0.020	ST	8	A	IN2005

Designation	XT Connection	D (mm)	S (mm)	C (mm)	Flute Type	# of Flutes	Front End Code	Grade
XSA11501R71	XT5	11.501	9.3	0.5	ST	6	A	IN2005
XSA12000R71	XT5	12.000	9.3	0.5	ST	6	A	IN2005
XSA13000R71	XT5	13.000	9.3	0.5	ST	6	A	IN2005
XSA13500R71	XT5	13.500	9.3	0.5	ST	6	A	IN2005
XSA13501R71	XT6	13.501	9.4	0.5	ST	6	A	IN2005
XSA14000R71	XT6	14.000	9.4	0.5	ST	6	A	IN2005
XSA15000R71	XT6	15.000	9.4	0.5	ST	6	A	IN2005
XSA16000R71	XT6	16.000	9.4	0.5	ST	6	A	IN2005
XSA16001R71	XT7	16.001	10.6	0.5	ST	6	A	IN2005
XSA17000R71	XT7	17.000	10.6	0.5	ST	6	A	IN2005
XSA18000R71	XT7	18.000	10.6	0.5	ST	6	A	IN2005
XSA19000R71	XT7	19.000	10.6	0.5	ST	6	A	IN2005
XSA20000R71	XT7	20.000	10.6	0.5	ST	6	A	IN2005
XSA20001R71	XT8	20.001	12.8	0.5	ST	8	A	IN2005
XSA21000R71	XT8	21.000	12.8	0.5	ST	8	A	IN2005
XSA22000R71	XT8	22.000	12.8	0.5	ST	8	A	IN2005
XSA23000R71	XT8	23.000	12.8	0.5	ST	8	A	IN2005
XSA24000R71	XT8	24.000	12.8	0.5	ST	8	A	IN2005
XSA25000R71	XT8	25.000	12.8	0.5	ST	8	A	IN2005
XSA26000R71	XT9	26.000	12.8	0.5	ST	8	A	IN2005
XSA27000R71	XT9	27.000	12.8	0.5	ST	8	A	IN2005
XSA28000R71	XT9	28.000	12.8	0.5	ST	8	A	IN2005
XSA29000R71	XT9	29.000	12.8	0.5	ST	8	A	IN2005
XSA30000R71	XT9	30.000	12.8	0.5	ST	8	A	IN2005
XSA31000R71	XT9	31.000	12.8	0.5	ST	8	A	IN2005
XSA32000R71	XT9	32.000	12.8	0.5	ST	8	A	IN2005

QWIKREAM™ HOLDERS



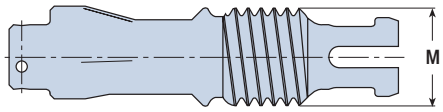
L/D Ratio	Designation	D inch(mm)	XT Connection	d (inch)	S (inch)	L (inch)	L1 (inch)	Shank Type	Shank Material
	XS5045117S6R01	.4528-.5315 (11.500-13.500)	XT5	0.625	0.374	3.061	1.17		
	XS6053132S6R01	.5316-.6299 (13.501-16.000)	XT6	0.625	0.374	3.209	1.32		
NEW 1.5XD	XS7063160S7R01	.6300-.7874 (16.001-20.000)	XT7	0.750	0.421	3.571	1.60	Cylindrical	Steel
	XS8079201S7R01	.7875-1.0000 (20.001-25.400)	XT8	0.750	0.508	3.976	2.01		
	XS9010240S9R01	1.0001-1.2600 (25.401-32.000)	XT9	1.250	0.508	4.760	2.40		
	XS5044133S6R01	.4528-.5315 (11.500-13.500)	XT5	0.625	0.374	3.85	1.96		
	XS6053226S6R01	.5316-.6299 (13.501-16.000)	XT6	0.625	0.374	4.15	2.26		
3XD	XS7063278S7R01	.6300-.7874 (16.001-20.000)	XT7	0.750	0.421	4.75	2.78	Cylindrical	Steel
	XS8079331S7R01	.7875-1.0000 (20.001-25.400)	XT8	0.750	0.508	5.43	3.46		
	XS9250076S9R01	1.0001-1.2600 (25.401-32.000)	XT9	1.250	0.508	6.58	4.22		
	XS5044222S6R01	.4528-.5315 (11.500-13.500)	XT5	0.625	0.374	4.92	3.03		
	XS6053350S6R01	.5316-.6299 (13.501-16.000)	XT6	0.625	0.374	5.41	3.52		
5XD	XS7063433S7R01	.6300-.7874 (16.001-20.000)	XT7	0.750	0.421	6.32	4.35	Cylindrical	Steel
	XS8079531S7R01	.7875-1.0000 (20.001-25.400)	XT8	0.750	0.508	7.39	5.43		
	XS9250127S9R01	1.0001-1.2600 (25.401-32.000)	XT9	1.250	0.508	9.10	6.74		
	XS5044355S6R01	.4528-.5315 (11.500-13.500)	XT5	0.625	0.374	6.52	4.63		
	XS6053540S6R01	.5316-.6299 (13.501-16.000)	XT6	0.625	0.374	7.30	5.41		
8XD	XS7063670S7R01	.6300-.7874 (16.001-20.000)	XT7	0.750	0.421	8.69	6.72	Cylindrical	Steel
	XS8079841S7R01	.7875-1.0000 (20.001-25.400)	XT8	0.750	0.508	10.35	8.38		
	XS9250105S9R01	1.0001-1.2600 (25.401-32.000)	XT9	1.250	0.508	12.88	10.52		

L/D Ratio	Designation	D mm(inch)	XT Connection	d (mm)	S (mm)	L (mm)	L1 (mm)	Shank Type	Shank Material
	XS5115030T3R01	11.500-13.500 (.4528-.5315)	XT5	16	9.50	77.8	29.8		
	XS6135034T3R01	13.501-16.000 (.5316-.6299)	XT6	16	9.50	81.5	33.5		
NEW 1.5XD	XS7160041T4R01	16.001-20.000 (.6300-.7874)	XT7	20	10.7	90.7	40.7	Cylindrical	Steel
	XS8200051T4R01	20.001-25.400 (.7875-1.0000)	XT8	20	12.9	101.0	51.0		
	XS9254121T3R01	25.401-32.000 (1.0001-1.2600)	XT9	32	12.9	120.9	60.9		
	XS5115050T3R01	11.500-13.500 (.4528-.5315)	XT5	16	9.50	97.8	49.8		
	XS6135057T3R01	13.501-16.000 (.5316-.6299)	XT6	16	9.50	105.4	57.4		
3XD	XS7160070T4R01	16.001-20.000 (.6300-.7874)	XT7	20	10.7	120.6	70.6	Cylindrical	Steel
	XS8200084T4R01	20.001-25.400 (.7875-1.0000)	XT8	20	12.9	137.8	87.8		
	XS9250107U7R01	25.401-32.000 (1.0001-1.2600)	XT9	32	12.9	167.1	107.1		
	XS5115077T3R01	11.500-13.500 (.4528-.5315)	XT5	16	9.50	125	77		
	XS6135089T3R01	13.501-16.000 (.5316-.6299)	XT6	16	9.50	137.4	89.4		
5XD	XS7160110T4R01	16.001-20.000 (.6300-.7874)	XT7	20	10.7	160.6	110.6	Cylindrical	Steel
	XS8200138T4R01	20.001-25.400 (.7875-1.0000)	XT8	20	12.9	187.8	137.8		
	XS9250171U7R01	25.401-32.000 (1.0001-1.2600)	XT9	32	12.9	231.1	171.1		
	XS5115117T3R01	11.500-13.500 (.4528-.5315)	XT5	16	9.50	165.5	117.5		
	XS6135137T3R01	13.501-16.000 (.5316-.6299)	XT6	16	9.50	185.4	137.4		
8XD	XS7160171T4R01	16.001-20.000 (.6300-.7874)	XT7	20	10.7	220.6	170.6	Cylindrical	Steel
	XS8200213T4R01	20.001-25.400 (.7875-1.0000)	XT8	20	12.9	262.8	212.8		
	XS9250267U7R01	25.401-32.000 (1.0001-1.2600)	XT9	32	12.9	327.1	267.1		

QWIKREAM™ CLAMPING KEY

Designation	XT Connection
TM-B5-KEY	XT5
TM-B6-KEY	XT6
TM-B7-KEY	XT7
TM-B8-KEY	XT8
TM-B9-KEY	XT9

QWIKREAM™ BAYONET SCREW



Designation	XT Connection	M
TM-B5-SCR	XT5	M5
TM-B6-SCR	XT6	M6
TM-B7-SCR	XT7	M7
TM-B8-SCR	XT8	M8
TM-B9-SCR	XT9	M9

QWIKREAM™ RECOMMENDED CUTTING CONDITIONS

ISO	Material	Condition	Material No.(1)	Through Hole		Interrupted Through Hole		Blind Hole		Interrupted Blind Hole	
P	Non-alloyed steel, cast steel, free cutting steel	Annealed	1	IN2005	LB	IN2005	LB	IN2005	SA	IN2005	SA
		Annealed	2	Vc = 260 - 660		Vc = 200 - 390		Vc = 200 - 530		Vc = 200 - 390	
		Quenched & tempered	3	XT5 - XT6	fz = .003 - .008	XT5 - XT6	fz = .002 - .007	XT5 - XT6	fz = .002 - .007	XT5 - XT6	fz = .002 - .006
		Annealed	4								
		Quenched & tempered	5	XT7 - XT9	fz = .005 - .011	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .003 - .008	XT7 - XT9	fz = .003 - .006
	Low alloyed steel, cast steel (lees than 5% alloying elements)	Annealed	6	IN2005	LB	IN2005	LB	IN2005	SA	IN2005	SA
			7	Vc = 260 - 660		Vc = 200 - 390		Vc = 200-530		Vc = 200 - 390	
		Quenched & tempered	8	XT5 - XT6	fz = .003 - .008	XT5 - XT6	fz = .002 - .007	XT5 - XT6	fz = .002 - .007	XT5 - XT6	fz = .002 - .006
			9	XT7 - XT9	fz = .005 - .011	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .003 - .008	XT7 - XT9	fz = .003 - .006
	High alloyed steel, cast steel, and tool steel	Annealed	10	IN2005	LB	IN2005	LB	IN2005	SA	IN2005	SA
				Vc =65 - 200		Vc = 65 - 200		Vc = 65 - 200		Vc = 65 - 200	
		Quenched & tempered	11	XT5 - XT6	fz = .002 - .005	XT5 - XT6	fz = .002 - .004	XT5 - XT6	fz = .002 - .004	XT5 - XT6	fz = .001 - .003
				XT7 - XT9	fz = .003 - .007	XT7 - XT9	fz = .002 - .006	XT7 - XT9	fz = .002 - .005	XT7 - XT9	fz = .002 - .004
M	Stainless steel, cast steel	Ferritic / martensitic	12	IN2005	LB	IN2005	LB	IN2005	SA	IN2005	SA
				Vc = 65 - 130		Vc = 65 - 130		Vc = 65 - 130		Vc = 65 - 130	
		Martensitic	13	XT5 - XT6	fz = .002 - .005	XT5 - XT6	fz = .002 - .004	XT5 - XT6	fz = .002 - .004	XT5 - XT6	fz = .001 - .003
		Austentic	14	XT7 - XT9	fz = .003 - .007	XT7 - XT9	fz = .002 - .006	XT7 - XT9	fz = .002 - .005	XT7 - XT9	fz = .002 - .004
K	Grey iron (GG)	Ferritic	15	IN2005	LB	IN2005	LB	IN2005	SA	IN2005	SA
				Vc = 390 - 720		Vc = 260 - 660		Vc = 260 - 660		Vc = 200 - 390	
		Pearlitic	16	XT5 - XT6	fz = .003 - .007	XT5 - XT6	fz = .002 - .005	XT5 - XT6	fz = .002 - .007	XT5 - XT6	fz = .002 - .005
				XT7 - XT9	fz = .004 - .009	XT7 - XT9	fz = .003 - .007	XT7 - XT9	fz = .003 - .009	XT7 - XT9	fz = .003 - .007
	Nodular iron (GGG)	Pearlitic / ferritic	17	IN2005	SA or LB	IN2005	LB	IN2005	SA	IN2005	SA
				Vc = 530 - 920		Vc = 490 - 820		Vc = 530 - 920		Vc = 530 - 790	
		Pearlitic / martensitic	18	XT5 - XT6	fz = .004 - .008	XT5 - XT6	fz = .002 - .006	XT5 - XT6	fz = .002 - .007	XT5 - XT6	fz = .002 - .006
				XT7 - XT9	fz = .004 - .009	XT7 - XT9	fz = .003 - .007	XT7 - XT9	fz = .003 - .009	XT7 - XT9	fz = .003 - .007
	Malleable iron, Nodular iron ferritic / pearlitic	Ferritic	19	IN2005	SA or LB	IN2005	LB	IN2005	SA	IN2005	SA
				Vc = 330 - 720		Vc = 330 - 720		Vc = 330 - 720		Vc = 330 - 720	
		Pearlitic	20	XT5 - XT6	fz = .004 - .008	XT5 - XT6	fz = .002 - .006	XT5 - XT6	fz = .002 - .007	XT5 - XT6	fz = .002 - .006
				XT7 - XT9	fz = .004 - .009	XT7 - XT9	fz = .003 - .008	XT7 - XT9	fz = .003 - .009	XT7 - XT9	fz = .003 - .008
N	Aluminum wrought alloy	Not cureable	21	RN01	LB or SG	RN01	LB	RN01	SG or SA	RN01	SG or SA
		Cured	22	Vc = 490 - 1310		Vc = 490 - 1150		Vc = 490 - 1310		Vc = 490 - 980	
	Aluminum - cast, alloyed	Not cureable	23								
		Cured	24	XT5 - XT6	fz = .003 - .006	XT5 - XT6	fz = .003 - .006	XT5 - XT6	fz = .003 - .006	XT5 - XT6	fz = .003 - .006
		High temperature	25	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008
	Copper alloys Brass , bronzes	Free cutting	26	IC30N	SA or SG	IC08	SG or SA	IC30N	SG or SA	IC08	SG or SA
				Vc = 590 - 790		Vc = 100 - 330		Vc = 590 - 790		Vc = 100 - 330	
		Brass	27	XT5 - XT6	fz = .002 - .006	XT5 - XT6	fz = .002 - .005	XT5 - XT6	fz = .002 - .006	XT5 - XT6	fz = .002 - .005
		Electrolitic copper	28	XT7 - XT9	fz = .003 - .008	XT7 - XT9	fz = .002 - .006	XT7 - XT9	fz = .003 - .008	XT7 - XT9	fz = .002 - .006
	Non-metallic	Duroplastics, fiber plastics	29	IN2005	SA	IN2005	SA	IN2005	SA	IN2005	SA
				Vc = 80 - 260		Vc = 80 - 260		Vc = 80 - 260		Vc = 80 - 260	
		Hard rubber	30	XT5 - XT6	fz = .002 - .004	XT5 - XT6	fz = .002 - .004	XT5 - XT6	fz = .002 - .005	XT5 - XT6	fz = .002 - .004
				XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008
S	* High temperature alloys	Annealed	31	IN2005	L *	IN2005	L*	IN2005	S*	IN2005	S*
		Cured	32	Vc = 50 - 160		Vc = 50 - 160		Vc = 50 - 160		Vc = 50 - 160	
		Annealed	33								
		Cured	34	XT5 - XT6	fz = .002 - .004	XT5 - XT6	fz = .001 - .003	XT5 - XT6	fz = .001 - .003	XT5 - XT6	fz = .001 - .003
		Cast	35								
	Titanium, Ti alloys		36	XT7 - XT9	fz = .002 - .005	XT7 - XT9	fz = .002 - .004	XT7 - XT9	fz = .002 - .004	XT7 - XT9	fz = .002 - .004
		Alpha+Beta alloys cured	37								
H	Hardened steel	Hardened	38	IN2005	LB	IN2005	LB	IN2005	SA	IN2005	SA
		Hardened	39	Vc = 80 - 160		Vc = 80 - 160		Vc = 80 - 160		Vc = 80 - 160	
		Cast	40	XT5 - XT6	fz = .002 - .005	XT5 - XT6	fz = .002 - .006	XT5 - XT6	fz = .002 - .005	XT5 - XT6	fz = .002 - .005
		Hardened	41	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008	XT7 - XT9	fz = .004 - .008

* Standard edge geometries are not suitable for reaming titanium and high temperature alloys. In order to choose a proper geometry, please ask for our recommendations.

- The given cutting data recommendations refer to short holders (3xD effective reaming overhang). For longer holders, the cutting speed must be reduced proportionally.
- For relatively large leading angles (spot-facing geometries), the feed must be reduced up to 30%.
- All the given cutting data recommendations refer to machines with spindle through coolant supply.

Legend: