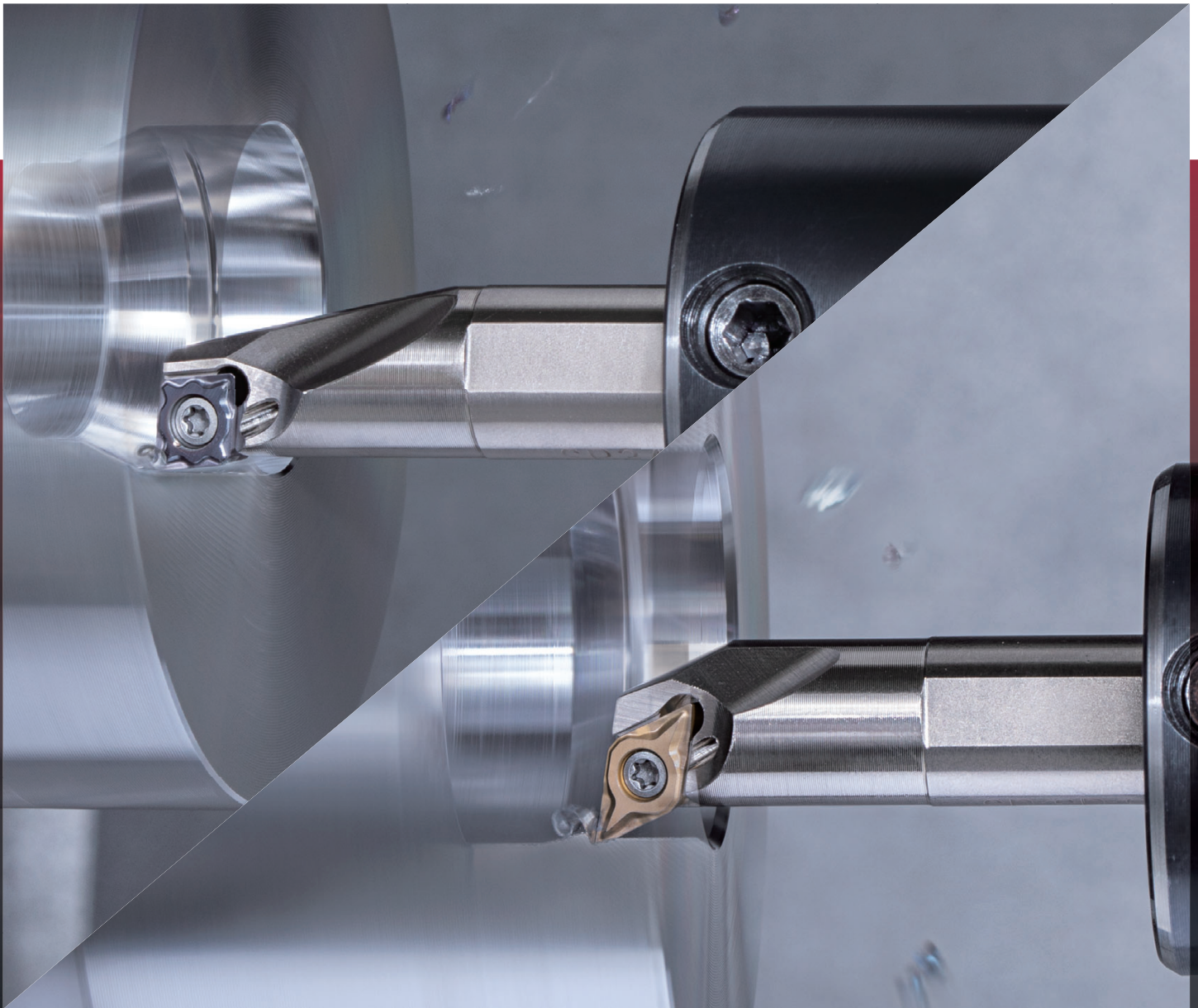


MINI^{FORCE}TURN

Tungaloy Report No. 417S1-US

Expansion of super economical **M class**
with double-sided positive insert





For more information

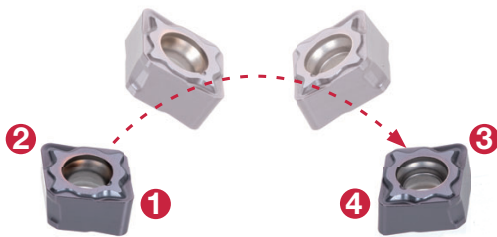
New geometry of CXMU insert and expansion of DXMU inserts

Super economical M class double-sided positive insert

New

CXMU insert

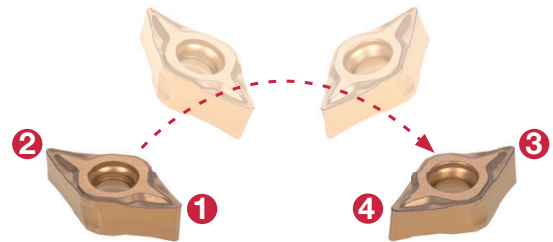
- 4 edges, rhombic 80°
- Chipbreaker: TS



New

DXMU insert

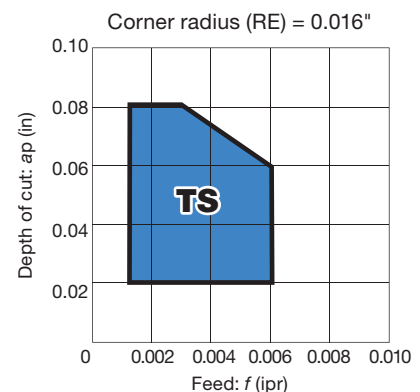
- 4 edges, rhombic 55°
- Chipbreaker: TS



APPLICATION AREA

TS chipbreaker

- First choice chipbreaker for medium to finish cutting
- Excellent chip control
- Ideal for small part machining



CHIP CONTROL

P

Depth of cut: ap (in)	0.08				
	0.06				
	0.04				
	0.02				
ap/f	0.002	0.004	0.006	0.008	0.8 Inch
Feed: f (ipr)					

Workpiece : 1045
 Insert : CXMU 221L TS T9215
 Toolholder : A12M-SCLXR06-D140
 Cutting speed : $V_c = 492$ sfm
 Boring depth : $H = 1.417$ " (L/D = 3)
 Coolant : Wet (internal supply)

M

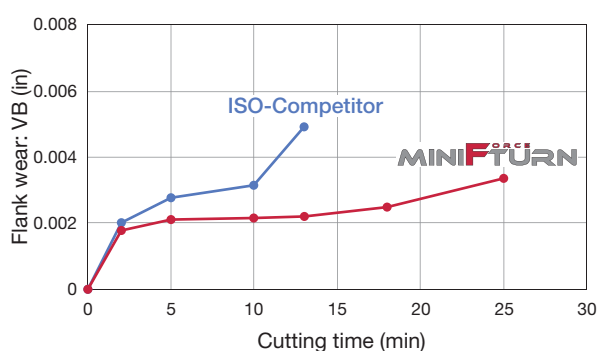
Depth of cut: ap (in)	0.06				
	0.04				
	0.02				
	0.01				
ap/f	0.002	0.003	0.004	0.006	0.8 Inch
Feed: f (ipr)					

Workpiece : 304
 Insert : CXMU 221L TS AH8015
 Toolholder : A12M-SCLXR06-D140
 Cutting speed : $V_c = 230$ sfm
 Boring depth : $H = 1.417$ " (L/D = 3)
 Coolant : Wet (internal supply)

GRADES

Grade	Recommended workpiece material	Feature
PREMIUMTEC New T9215	P M K	- Well-balanced between wear and chipping resistance - First choice for steel - High versatility for a wide range of applications
PREMIUMTEC New T9225	P	- First choice for roughing to medium cutting - High fracture resistance
PREMIUMTEC AH8015	P M K S	- PVD coated grade with a balanced resistance to wear and fracture - First choice for stainless steel and heat-resistant superalloys
PREMIUMTEC AH725	P M K	- Versatile PVD coated grade suitable for a wide range of work materials - Demonstrates a balanced resistance to wear and fracture

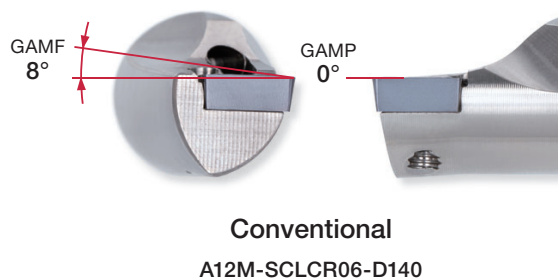
TOOL LIFE



P Insert : DXMU 221L TS T9215 (**MiniForce-Turn**)
 DCMT 21.51 type Competitor's PVD-P15 grade (ISO)
 Toolholder : A12-SDXXR2-D16 (**MiniForce-Turn**)
 A12-SDUCR3-D16 (ISO)
 Workpiece material : 4140
 Cutting speed : $V_c = 820$ sfm
 Feed : $f = 0.004$ ipr
 Depth of cut : $a_p = 0.004$ "
 Coolant : Wet

New M class **MiniForce-Turn** and latest CVD grade **T9215** provides high productivity and high wear resistance compared to competitor's ISO positive PVD grade insert.

Low cutting force machining with high rake angle



CUTTING PERFORMANCE

Excellent chatter stability

Workpiece : S1045
 Insert : CXMU 221L TS AH725
 Toolholder : A12M-SCLXR06-D140
 Cutting speed : $V_c = 492$ sfm
 Overhang length : 1.417" (L/D = 3)
 Coolant : Wet (internal supply)

MINIForce-Turn

Depth of cut a_p (in)	0.08	OK	OK	OK	OK
	0.06	OK	OK	OK	OK
	0.04	OK	OK	OK	OK
	0.02	OK	OK	OK	OK
	a_p/f	0.002	0.004	0.006	0.008
Feed: f (ipr)					

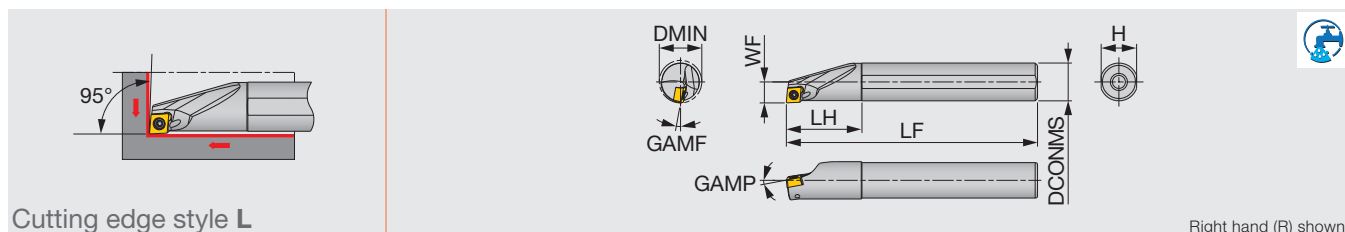
ISO positive insert, M class

Depth of cut a_p (in)	0.08	OK	OK	OK	OK
	0.06	OK	OK	OK	OK
	0.04	OK	OK	OK	OK
	0.02	OK	OK	OK	OK
	a_p/f	0.002	0.004	0.006	0.008
Feed: f (ipr)					

New

A/E-SCLXR/L

Screw-on boring bar, for CXMU inserts



Cutting edge style L

Right hand (R) shown.

Metric	Material	DMIN	DCONMS	WF	LF	LH	H	GAMP	GAMF	RE**	Insert	Torque*
A10K-SCLXR/L06-D120	Steel	12	10	6	125	20	9	-10°	-14.5°	0.4	CXMU0603**L/R...	0.9
A12M-SCLXR/L06-D140	Steel	14	12	7	150	24	11	-10°	-12.5°	0.4	CXMU0603**L/R...	0.9
A16Q-SCLXR/L06-D180	Steel	18	16	9	180	32	15	-10°	-9.5°	0.4	CXMU0603**L/R...	0.9
A20R-SCLXR/L06-D220	Steel	22	20	11	200	36	18	-10°	-8°	0.4	CXMU0603**L/R...	0.9
E10M-SCLXR/L06-D120	Carbide	12	10	6	150	25	9	-10°	-14.5°	0.4	CXMU0603**L/R...	0.9
E12Q-SCLXR/L06-D140	Carbide	14	12	7	180	27	11	-10°	-12.5°	0.4	CXMU0603**L/R...	0.9
E16R-SCLXR/L06-D180	Carbide	18	16	9	200	32	15	-10°	-9.5°	0.4	CXMU0603**L/R...	0.9
E20S-SCLXR/L06-D220	Carbide	22	20	11	250	36	18	-10°	-8°	0.4	CXMU0603**L/R...	0.9

*Torque: Recommended clamping torque N-m **RE: Standard corner radius

Use right-hand toolholders (R) with left-hand inserts (L); and left-hand toolholders (L) with right-hand inserts (R).

SPARE PARTS

Designation	Clamping screw	Wrench
A/E**-SCLXR/L...	SR34-514	T-7F

- 1 Use the right hand toolholder (R) for the left hand insert (L)
- 2 Use the left hand toolholder (L) for the right hand insert (R)

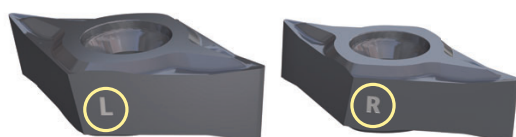


- 1 Right hand toolholder with left hand insert shown



- 2 Left hand toolholder with right hand insert shown

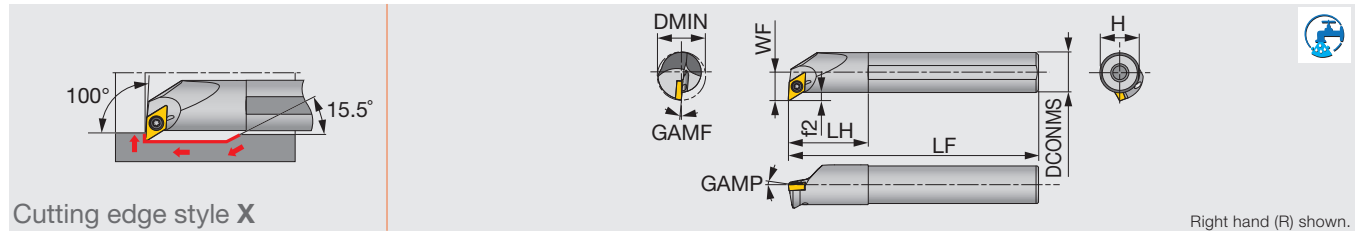
MARKING



Insert hand is identified on the flank side

A/E-SDXXR/L

Screw-on boring bar, for DXMU/DXGU inserts



Inch	Material	DMIN	DCONMS	WF	LF	LH	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A06-SDXXR/L2-D10	Steel	0.625	0.375	0.406	5.000	0.750	0.350	0.218	-14°	-16°	0.016	DXMU/DXGU22*L/R...	0.66
A08-SDXXR/L2-D11	Steel	0.688	0.500	0.406	5.000	1.000	0.475	0.156	-14°	-14°	0.016	DXMU/DXGU22*L/R...	0.66
A10-SDXXR/L2-D14	Steel	0.875	0.625	0.531	7.000	1.250	0.600	0.218	-13°	-13°	0.016	DXMU/DXGU22*L/R...	0.66
A12-SDXXR/L2-D16	Steel	1.000	0.750	0.593	7.000	1.438	0.725	0.218	-13°	-12°	0.016	DXMU/DXGU22*L/R...	0.66
E06-SDXXR/L2-D10	Carbide	0.625	0.375	0.406	5.000	1.000	0.350	-	-14°	-16°	0.016	DXMU/DXGU22*L/R...	0.66
E08-SDXXR/L2-D11	Carbide	0.688	0.500	0.406	5.000	1.063	0.475	-	-14°	-14°	0.016	DXMU/DXGU22*L/R...	0.66
E10-SDXXR/L2-D14	Carbide	0.875	0.625	0.531	7.000	1.250	0.600	-	-13°	-13°	0.016	DXMU/DXGU22*L/R...	0.66
E12-SDXXR/L2-D16	Carbide	1.000	0.750	0.593	7.000	1.438	0.725	-	-13°	-12°	0.016	DXMU/DXGU22*L/R...	0.66

Metric	Material	DMIN	DCONMS	WF	LF	LH	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A10K-SDXXR/L07-D130	Steel	13	10	7.6	125	20	9	2.6	-14°	-16°	0.4	DXMU/DXGU0703**L/R...	0.9
A12M-SDXXR/L07-D160	Steel	16	12	8.6	150	24	11	2.6	-14°	-14°	0.4	DXMU/DXGU0703**L/R...	0.9
A16Q-SDXXR/L07-D200	Steel	20	16	10.6	180	32	15	2.6	-13°	-13°	0.4	DXMU/DXGU0703**L/R...	0.9
A20R-SDXXR/L07-D240	Steel	24	20	12.6	200	36	18	2.6	-13°	-12°	0.4	DXMU/DXGU0703**L/R...	0.9
E10M-SDXXR/L07-D130	Carbide	13	10	7.6	150	25	9	2.6	-14°	-16°	0.4	DXMU/DXGU0703**L/R...	0.9
E12Q-SDXXR/L07-D160	Carbide	16	12	8.6	180	27	11	2.6	-14°	-14°	0.4	DXMU/DXGU0703**L/R...	0.9
E16R-SDXXR/L07-D200	Carbide	20	16	10.6	200	32	15	2.6	-13°	-13°	0.4	DXMU/DXGU0703**L/R...	0.9
E20S-SDXXR/L07-D240	Carbide	24	20	12.6	250	36	18	2.6	-13°	-12°	0.4	DXMU/DXGU0703**L/R...	0.9

*Torque: Recommended clamping torque lbs-ft (*N·m) **RE : Standard corner radius

Use right-hand toolholders (R) with left-hand inserts (L); and left-hand toolholders (L) with right-hand inserts (R)

SPARE PARTS

Designation	Clamping screw	Wrench
A/E**-SDXXR/L...	SR34-514	T-7F

- 1 Use the right hand toolholder (R) for the left hand insert (L)
- 2 Use the left hand toolholder (L) for the right hand insert (R)



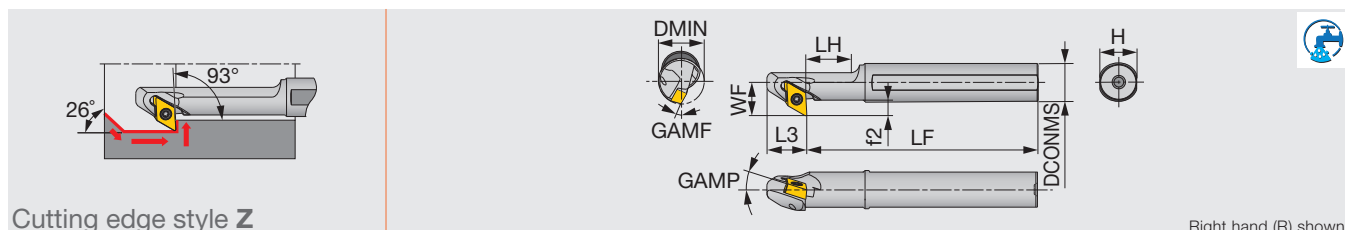
- 1 Right hand toolholder with left hand insert shown



- 2 Left hand toolholder with right hand insert shown

A/E-SDZXR/L

Screw-on boring bar, for DXMU/DXGU inserts



Cutting edge style Z

Right hand (R) shown.

Inch	Material	DMIN	DCONMS	WF	LF	LH	L3	H	f2	GAMP	GAMF	**RE	Insert	Torque*
A08-SDZXR/L2-D10	Steel	0.625	0.500	0.438	5.000	1.125	0.500	0.475	0.188	-10°	-14°	0.016	DXMU/DXGU22*L/R...	0.66
A10-SDZXR/L2-D11	Steel	0.688	0.625	0.500	7.000	1.250	0.500	0.600	0.188	-10°	-12.5°	0.016	DXMU/DXGU22*L/R...	0.66
A12-SDZXR/L2-D14	Steel	0.875	0.750	0.563	7.000	1.375	0.500	0.725	0.188	-10°	-10.5°	0.016	DXMU/DXGU22*L/R...	0.66

Metric	Material	DMIN	DCONMS	WF	LF	LH	L3	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A12M-SDZXR/L07-D140	Steel	14	12	10.5	150	30	13	11	4.5	-10°	-14°	0.4	DXMU/DXGU0703**R/L...	0.9
A16Q-SDZXR/L07-D160	Steel	16	16	12.5	180	35	13	15	4.5	-10°	-12.5°	0.4	DXMU/DXGU0703**R/L...	0.9
A20R-SDZXR/L07-D200	Steel	20	20	14.5	200	40	13	18	4.5	-10°	-10.5°	0.4	DXMU/DXGU0703**R/L...	0.9
E12Q-SDZXR/L07-D180	Carbide	18	12	10.5	180	-	13	11	4.5	-11°	-11°	0.4	DXMU/DXGU0703**R/L...	0.9
E16R-SDZXR/L07-D220	Carbide	22	16	12.5	200	-	13	15	4.5	-11°	-9°	0.4	DXMU/DXGU0703**R/L...	0.9

*Torque: Recommended clamping torque lbs-ft (*N·m) **RE : Standard corner radius

Use right-hand toolholders (R) with right-hand inserts (R); and left-hand toolholders (L) with left-hand inserts (L).

SPARE PARTS

Designation	Clamping screw	Wrench
A/E**-SDZXR/L...	SR34-514	T-7F

- Right hand toolholders (R) are used with right hand inserts (R)
- Left hand toolholders (L) are used with left hand inserts (L)



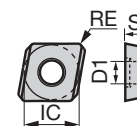
1 Right hand toolholder with right hand insert shown



2 Left hand toolholder with left hand insert shown

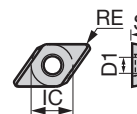
- : Continuous cutting
- ◐ : Light interrupted cutting
- ⊗ : Heavy interrupted cutting

**Rhombic, 80°
with hole**

[illegible]

Application		Chipbreaker	Designation	Inch	Metric	Coated												Dimension (in)			
						T9215	T9225	AH8015	AH725												
Finishing to medium cutting		TS	CXMU 220.5R TS	CXMU060302R-TS	●	●	●	●										RE	IC	S	D1
			CXMU 220.5L TS	CXMU060302L-TS	●	●	●	●										0.008	0.250	0.125	0.106
			CXMU 221R TS	CXMU060304R-TS	●	●	●	●										0.008	0.250	0.125	0.106
			CXMU 221L TS	CXMU060304L-TS	●	●	●	●										0.016	0.250	0.125	0.106
			CXMU 222R TS	CXMU060308R-TS	●	●	●	●										0.016	0.250	0.125	0.106
			CXMU 222L TS	CXMU060308L-TS	●	●	●	●										0.032	0.250	0.125	0.106

**Rhombic, 55°
with hole**

[illegible]

Application	Chipbreaker	Designation		material				Coated												Dimension (in)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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● : New product

STANDARD CUTTING CONDITIONS

FOR INTERNAL TURNING

ISO	Workpiece material	Grade		Cutting speed Vc (sfm)	Depth of cut ap (in)	Feed f (ipr)
		First choice	Second choice			
P	Low carbon steel / Low alloy steel	T9215	-	394 - 1148	0.012 - 0.079	0.003 - 0.012
		T9225	-	328 - 984	0.012 - 0.079	0.003 - 0.012
		AH8015	-	164 - 656	0.012 - 0.079	0.003 - 0.012
		-	AH725	164 - 591	0.012 - 0.079	0.003 - 0.012
		-	NS9530	262 - 820	0.012 - 0.079	0.003 - 0.012
		-	GT9530	262 - 984	0.012 - 0.079	0.003 - 0.012
	Carbon steel / Alloy steel	T9215	-	262 - 1148	0.012 - 0.079	0.003 - 0.012
		T9225	-	262 - 984	0.012 - 0.079	0.003 - 0.012
		AH8015	-	164 - 656	0.012 - 0.079	0.003 - 0.012
		-	AH725	164 - 591	0.012 - 0.079	0.003 - 0.012
		-	NS9530	262 - 820	0.012 - 0.079	0.003 - 0.012
		-	GT9530	262 - 984	0.012 - 0.079	0.003 - 0.012
M	Stainless steel (Austenitic)	AH8015	-	164 - 492	0.012 - 0.079	0.003 - 0.012
		-	AH725	164 - 492	0.012 - 0.079	0.003 - 0.012
		-	T9215	164 - 656	0.012 - 0.079	0.003 - 0.012
	Stainless steel (Martensitic and ferritic)	AH8015	-	164 - 492	0.012 - 0.079	0.003 - 0.012
		-	AH725	164 - 492	0.012 - 0.079	0.003 - 0.012
		-	T9215	164 - 656	0.012 - 0.079	0.003 - 0.012
	Stainless steel (Precipitation hardening)	AH8015	-	164 - 492	0.012 - 0.079	0.003 - 0.012
		-	AH725	164 - 492	0.012 - 0.079	0.003 - 0.012
		-	T9215	164 - 656	0.012 - 0.079	0.003 - 0.012
K	Gray cast iron	T9215	-	328 - 1148	0.012 - 0.079	0.003 - 0.012
		T9225	-	328 - 1148	0.012 - 0.079	0.003 - 0.012
		-	AH8015	164 - 656	0.012 - 0.079	0.003 - 0.012
		-	AH725	164 - 591	0.012 - 0.079	0.003 - 0.012
		-	NS9530	262 - 820	0.012 - 0.079	0.003 - 0.012
		-	GT9530	262 - 984	0.012 - 0.079	0.003 - 0.012
	Ductile cast iron	T9215	-	328 - 1148	0.012 - 0.079	0.003 - 0.012
		T9225	-	328 - 1148	0.012 - 0.079	0.003 - 0.012
		-	AH8015	164 - 656	0.012 - 0.079	0.003 - 0.012
		-	AH725	164 - 591	0.012 - 0.079	0.003 - 0.012
		-	NS9530	262 - 820	0.012 - 0.079	0.003 - 0.012
		-	GT9530	262 - 984	0.012 - 0.079	0.003 - 0.012
N	Aluminum alloys	KS05F	-	328 - 984	0.012 - 0.079	0.003 - 0.012
	Copper alloys	KS05F	-	328 - 984	0.012 - 0.079	0.003 - 0.012
S	Titanium alloys	AH8015	-	66 - 262	0.012 - 0.079	0.003 - 0.012
	Nickel-based alloys	AH8015	-	66 - 262	0.012 - 0.079	0.003 - 0.012
H	Hardened steel	BXA20	-	164 - 722	0.005 - 0.031	0.004 - 0.012
		-	BXA10	164 - 722	0.005 - 0.031	0.004 - 0.012



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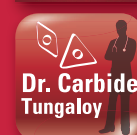


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