

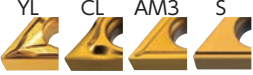

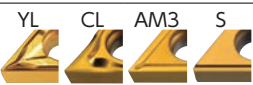
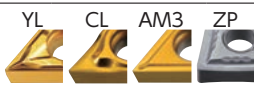


# Recommended Insert Grade and Cutting Conditions

## Front Turning

CSVF / CC.. / DC.. / VC.. / VB.. / TN.. / TF

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DT4			DT4	TM4	QM3	
	2nd choice	TM4 / QM3			QM3 / VM1	QM3	TM4 / DT4 / C7Z(X)	
Cutting Speed (SFM)		75 125 225	100 200 275		130 230 330	150 300 600	Carbide C7Z(X)	150 300 500 400 500 800
Recommended Chipbreaker Feed Rate (IPR)	≤.004 DOC	AMX KHG 			AMX KHG 			
		.0004 .0008 .0012			.0004 .0012 .0016			
	.004 to .060 DOC	YL CL AM3 S 			YL CL AM3 AZ7 S U/U1 UL 			
		.0008 .0016 .0024			.0008 .0020 .0032			
	≥ .060 DOC	YL CL AM3 S 			YL CL AM3 ZP 			
		.0008 .0015 .0025			.0012 .0024 .0040			

## Back Turning

CSVB

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DT4						VM1
	2nd choice	VM1						DT4
Cutting Speed (SFM)		75 125 225	100 200 275				100 200 300	
Feed Rate (IPR)	X Direction							.0004 .0008 .0012
	Z Direction							.0004 .0012 .0016

TBDP / TBMH / TBP / TBPA / TBVC

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DT4			DT4 / QM3	TM4	QM3	
	2nd choice	TM4 / QM3			VM1	QM3	TM4 / DT4 / C7Z(X)	
Cutting Speed (SFM)		75 125 225	100 200 275			150 300 500		
Feed Rate (IPR)	X Direction	.0004 .0008 .0012					.0004 .0008 .0016	
	Z Direction	.0008 .0016 .0024					.0008 .0016 .0031	

TB32 / TB43

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	ZM3						ZM3
	2nd choice	ZM3						Z15
Cutting Speed (SFM)		50 100 150					ZM3 150 300 425 Z15 400 600 800	
Feed Rate (IPR)	X Direction	.0004 .0012 .0020					.0004 .0012 .0020	
	Z Direction	.0016 .0020 .0031					.0016 .0031 .0059	

# Recommended Insert Grade and Cutting Conditions

## Cut Off

CSV T

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
					Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DT4					VM1	
	2nd choice	VM1					DT4	
Cutting Speed (SFM)		100 160 230			100 200 300			
Feed Rate (IPR)		.0004 .0008 .0012			.0004 .0012 .0020			

### CTP / CTPA / CTPS / CTPW

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
					Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DT4				TM4	QM3	
	2nd choice	TM4		QM3 / VM1		QM3	TM4 / DT4 / C7Z(X)	
Cutting Speed (SFM)		100 160 230			100 200 300			
Feed Rate (IPR)		.0008 .0012 .0020			.0008 .0016 .0024			

### CTDP / CTWP / CTV

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
					Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DM4				TM4	QM3	
	2nd choice	TM4 / QM3				QM3	TM4 / DM4	
Cutting Speed (SFM)		100 160 230			100 200 300			
Feed Rate (IPR)		.0012 .0020 .0031			.0016 .0031 .0047			

## Grooving

CSV / GTG / GTMH / GTMT / GTMX / SBG

Work Material	High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
				Hard to cut	Free cutting		
Common Name	Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DT4		DM4 / DT4	TM4	QM3	
	2nd choice	TM4 / QM3		QM3 / VM1	QM3	TM4 / DT4 / C7Z(X)	
Cutting Speed (SFM)		75 125 225	100 200 275	130 230 330	150 300 600	Carbide C7Z(X)	150 300 500 400 500 800
Feed Rate (IPR) A. Grooving B. Side turning*	Width .010-.020	A. .0002 - .0012					
		B. .0001 - .0002					
	.020-.040	A. .0008 - .0024					A. .0008 - .0028
		B. .0002 - .0004					B. .0002 - .0004
.040-.080	A. .0012 - .0028					A. .0012 - .0031	
	B. .0008 - .0020					B. .0012 - .0024	
> .080	A. .0012 - .0079						
	B. .0012 - .0024						

\*When side turning, Max. DOC is under .0079". Under .016" width side turning impossible

### GVW / Groove Duo

Work Material	High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
				Hard to cut	Free cutting		
Common Name	Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	QM3					
	2nd choice	QM3					
Cutting Speed (SFM)		75 125 225	100 200 275	130 230 330	150 300 600	150 300 500	
Feed Rate (IPR) A. Grooving B. Side turning*	Width .118-.157	A. .0020 - .0059					
	.157-.197	A. .0039 - .0079					A. .0039 - .0098
							B. .0059 - .0118
> .197	A. .0059 - .0138						

\*Max DOC is 80% of width

### GTPA

Work Material	Aluminum Alloy	
Common Name	ASTM 5056 ASTM 6061	
Grade	1st choice	PD1
	2nd choice	KM1
Cutting Speed (SFM)		PD1 330 650 1000 KM1 160 330 650
Feed Rate (IPR) A. Grooving B. Side turning	A. .0020 - .0079	
	B. .0039 - .0079	

# Recommended Insert Grade and Cutting Conditions

## Threading

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
					Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	VM1		VM1 / ZM3		QM3		
	2nd choice	ZM3		QM3		VM1 / ZM3		
Cutting Speed (SFM)		75 125 225	100 200 275	130 230 330	150 300 600	150 300 500		

\*Unless your machine is equipped with high speed threading program, please set the feed rate to 80 IPM or lower to prevent making incomplete threads

## ID Boring

diameter ≤ .240" (LBM / STICK DUO)

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
					Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	TM4					VM1 / TM4	
	2nd choice	VM1 / ZM3					ZM3	
Cutting Speed (SFM)		60 160 230				100 200 300		
Feed Rate (IPR)		.0004 .0012 .0020						
Depth Of Cut (DOC)		.0020 .0031 .0039						

diameter > .240"

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
					Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DT4		DT4	TM4	QM3		
	2nd choice	TM4		QM3 / TM4	QM3	TM4 / DT4 / C7Z(X)		
Cutting Speed (SFM)		150 230 330		130 230 330	150 300 600	Carbide C7Z(X) 150 300 500 400 500 800		
Feed Rate (IPR)		.0008 .0024 .0047						
Depth Of Cut (DOC)		.0039 .0197 .0787						