

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	
					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 / DT4			ST4 DM4	DM4 DT4	TM4	QM3	
	2nd choice	TM4 / QM3			QM3 / VM1		QM3	TM4 / DM4 / DT4	
Cutting Speed (SFM)		75 125 225	100 200 275		130 230 330	150 300 600	150 300 500		
Feed Rate (IPR)	≤.004 DOC	AMX KHG .0004 .0008 .0012				AMX KHG .0004 .0012 .0016			
	.004 to .060 DOC	YL CL AM3 S .0008 .0016 .0024				YL CL AM3 AZ7 S U/U1 UL .0008 .0020 .0032			
	≥ .060 DOC	YL CL AM3 S .0008 .0015 .0025				YL CL AM3 ZP .0012 .0024 .0040			

Back Turning

CSVB

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 / DT4					VM1		
	2nd choice	VM1					DM4 / 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	
					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 / DT4			ST4 DM4	DM4 DT4 QM3	TM4	QM3	
	2nd choice	TM4 / QM3			VM1		QM3	TM4 / DM4 / DT4	
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	
					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						ZM3	
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			

Tooling for
Swiss-type Lathes

[Recommended cutting conditions]

Cut Off

CSV

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 / DT4					VM1		
	2nd choice	VM1					DM4 / 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	DM4 / DT4			ST4 DM4	DM4 DT4	TM4	QM3	
	2nd choice	TM4			QM3 / VM1		QM3	TM4 / DM4 / DT4	
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	DT4			ST4 DM4	DM4 DT4	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			

Recommended Insert Grade and Cutting Conditions

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	DM4 / DT4			ST4 DM4	DM4 DT4	TM4	QM3		
	2nd choice	TM4 / QM3			QM3 / VM1		QM3	TM4 / DM4 / DT4		
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 .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

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	DM4 / DT4					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	DM4 / DT4			ST4 DM4	DM4 DT4	TM4	QM3	
	2nd choice	TM4			QM3 / TM4		QM3	TM4 / DT4	
Cutting Speed (SFM)		150 230 330			130 230 330	150 300 600	150 300 500		
Feed Rate (IPR)		.0008 .0024 .0047							
Depth Of Cut (DOC)		.0039 .0197 .0787							