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	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 150 **300** 500 C7Z(X) 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
					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
					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
					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						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

CSVT

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 150 300 500 C7Z(X) 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 B. .0002 - .0004						A. .0008 - .0028 B. .0002 - .0004
	.040-.080	A. .0012 - .0028 B. .0008 - .0020						A. .0012 - .0031 B. .0012 - .0024
	> .080	A. .0012 - .0079 B. .0012 - .0024						

*When side turining, 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							
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 150 300 500 C7Z(X) 400 500 800	
Feed Rate (IPR)		.0008 .0024 .0047						
Depth Of Cut (DOC)		.0039 .0197 .0787						