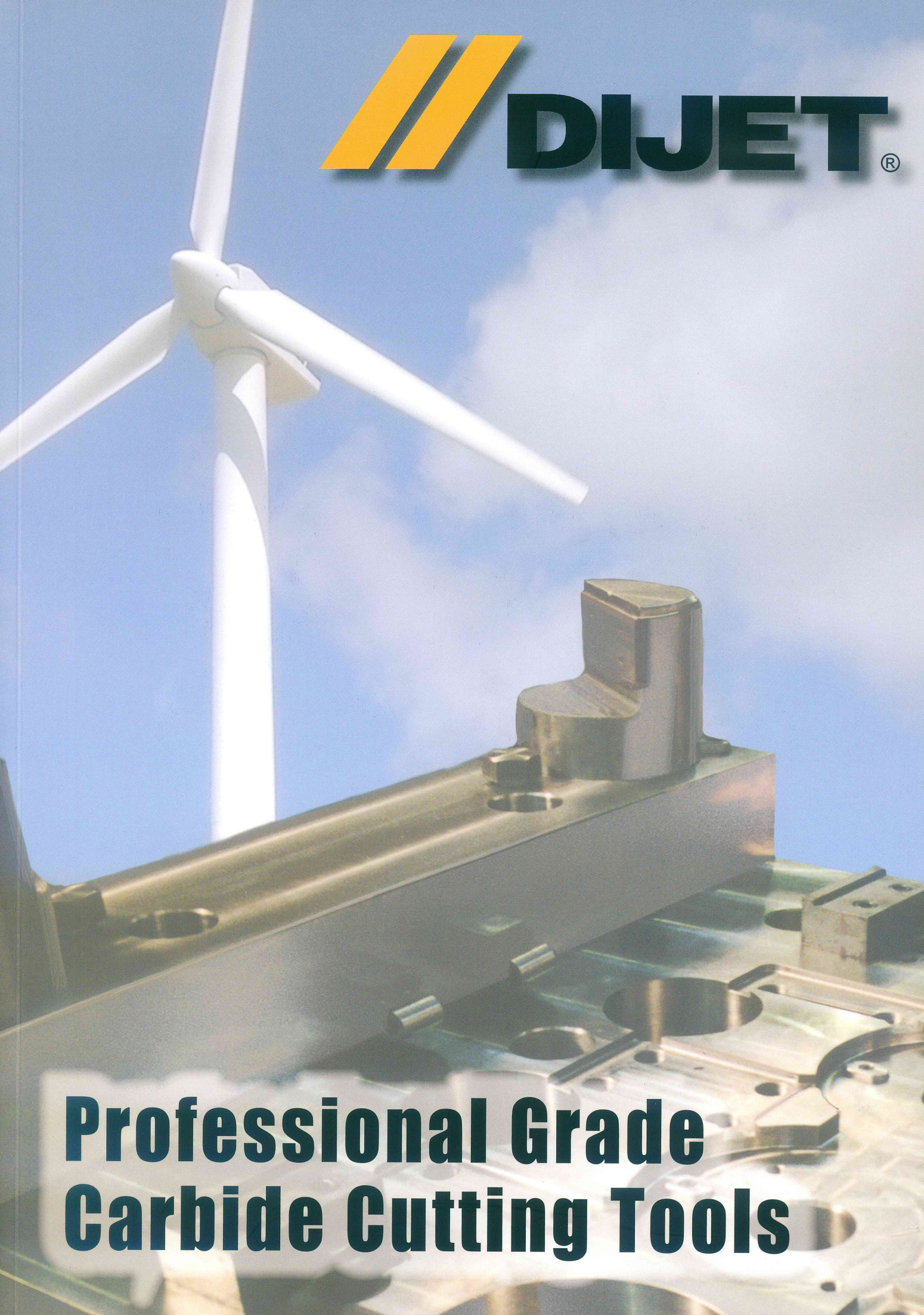
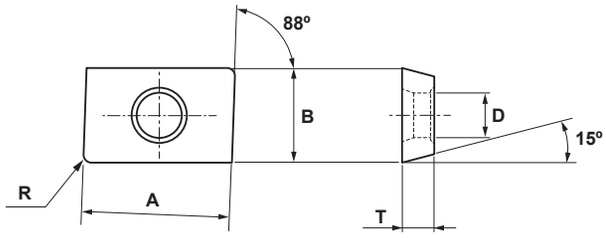
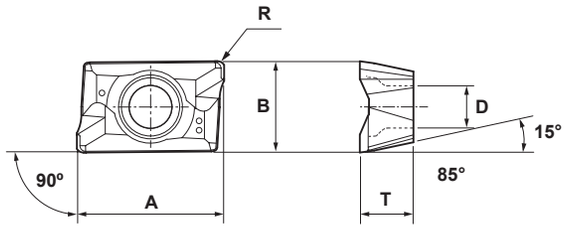

DIJET®
Professional Grade
Carbide Cutting Tools

ISO Milling Inserts

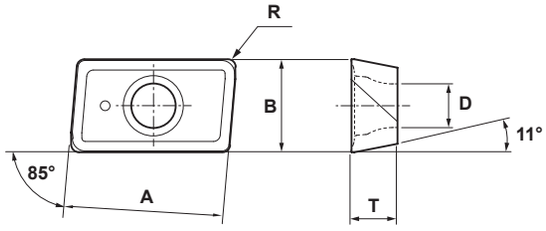
METRIC



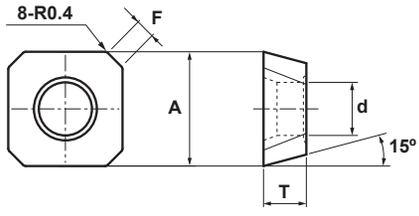
CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	B	T	R	D	JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
ADHX150308	15	9.525	3.19	0.8	4.5		•	•	•		•			•	•
ADHT150308	15	9.525	3.18	0.8	4.5			•	•						



CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	B	T	R	D	JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
ADKT150508PDER	15.9	9.683	5.64	0.8	4.5			•	•		•				



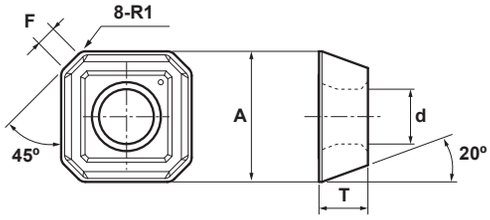
CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	B	T	R	D	JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
APKT100305PDER	10.379	6.703	3.5	0.5	2.85		•	•	•		•				
APKT160408	16.463	9.542	4.76	0.8	4.5			•	•						
APKT1604PDR	16.828	9.54	5.7	0.8	4.6		•	•	•		•				



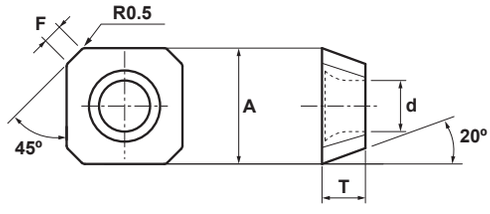
CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	F	d		JC8015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SDHW1204AFFN	12.7	4.76	2.1	5.9							•				
SDHW1204AFTN	12.7	4.76	2.1	5.9			•	•	•						

METRIC

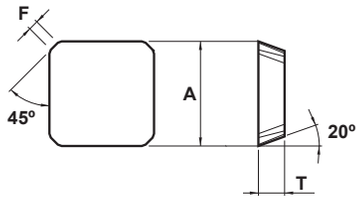
ISO Milling Inserts



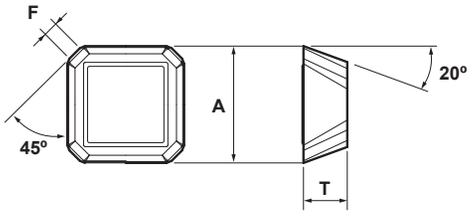
CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	F	d		JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SEHT1204AFTN	12.7	4.76	2.0	5.5				•	•		•				



CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	F	d		JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SEHW1204AFTN	12.7	4.76	2.1	5.6				•	•						



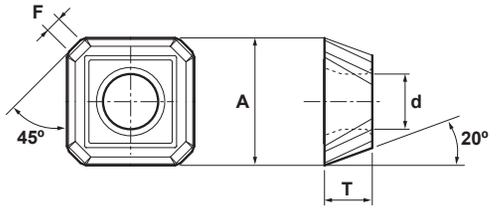
CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	F			JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SEKN1203AFFN	12.7	3.18	1.2												•
SEKN1203AFTN	12.7	3.18	1.2			•		•	•	•	•	•	■		
SEKN1203AFFN-16	12.7	3.18	1.6								■				■
SEKN1203AFTN-16	12.7	3.18	1.6					•	•			•	•		
SEKN1204AFFN	12.7	4.76	1.2								•				•
SEKN1204AFTN	12.7	4.76	1.2				•	•	•	•				■	
SEKN1504AFFN	15.875	4.76	1.5												•
SEKN1504AFTN	15.875	4.76	1.5					•	•						



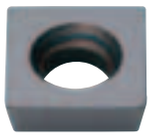
CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	F			JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SEKR1203AFTN	12.7	3.18	1.6					•	•						

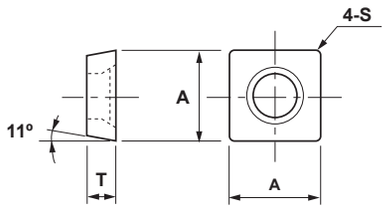
ISO Milling Inserts

METRIC

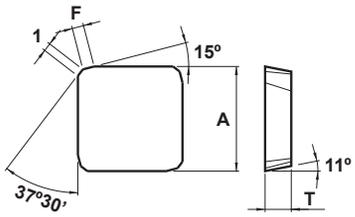


CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	F	d		JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SEKT1204AFTN	12.7	4.79	1.6	5.5				•	•						

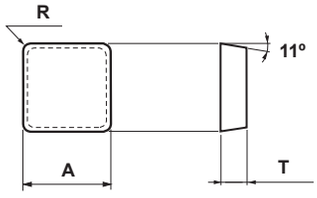




CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	R			JC8015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SPGA090304	9.525	3.18	0.4					•	•						
SPMA090304	9.525	3.18	0.4			•									
SPMA090308	9.525	3.18	0.8			•									



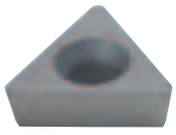
CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	F			JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SPKN1203EDFR	12.7	3.18	1.4								•				•
SPKN1203EDTR	12.7	3.18	1.4			•		•	•	•		•			
SPKN1504EDFR	15.875	4.76	1.6								•				
SPKN1504EDTR	15.875	4.76	1.6			•		•	•	•					

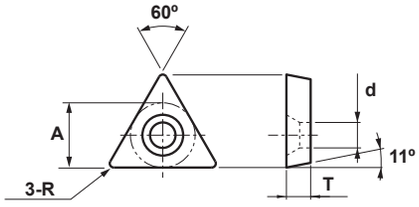


CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	R			JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	UM30	KT9
SPMN120308T	12.7	3.18	0.8							•					
SPMN120312T	12.7	3.18	1.2							•					
SPMN120408T	12.7	4.76	0.8							■					
SPMN120412T	12.7	4.76	1.2							•					

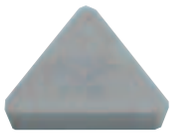
METRIC

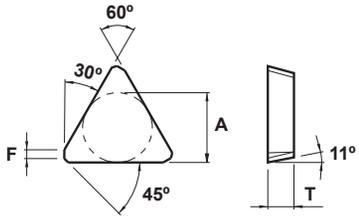
ISO Milling Inserts





CATALOG NUMBER	DIMENSIONS				COATED						CERMET		UNCOATED
	A	T	R	d	JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	KT9
TPGW080204	4.76	2.38	0.4	2.4			•				•		•
TPGW090204	5.56	2.38	0.4	2.5			•				•		•
TPGW110204	6.35	2.38	0.4	2.8			•				•		•
TPGW110302	6.35	3.18	0.2	3.5			•				•		•
TPGW110304	6.35	3.18	0.4	3.5			•				•		•
TPGW110308	6.35	3.18	0.8	3.5			•				•		•
TPGW130302	7.94	3.18	0.2	3.5			•				•		•
TPGW130304	7.94	3.18	0.4	3.5			•				•		•
TPGW130308	7.94	3.18	0.8	3.5			•				•		•
TPGW160302	9.525	3.18	0.2	4.6			•				•		•
TPGW160304	9.525	3.18	0.4	4.6			•				•		•
TPGW160308	9.525	3.18	0.8	4.6			•				•		•

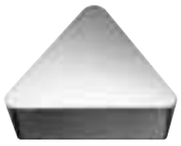


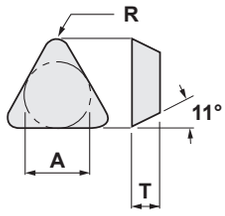


CATALOG NUMBER	DIMENSIONS			COATED						CERMET		UNCOATED	
	A	T	F	JC5015	JC3552	JC5030	JC5040	JC730U	JC610	CX90	CX75	KT9	DX30
TPKN1603PPTR	9.525	3.18	1.2	•	•	•	•						■
TPKN2204PDFR	12.70	4.76	1.6						•			•	
TPKN2204PDTR	12.70	4.76	1.6	•	•	•	•	•		•			•

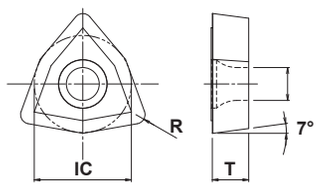
ISO Milling Inserts

METRIC





CATALOG NUMBER	DIMENSIONS					COATED						CERMET		UNCOATED	
	A	T	R			JC5015	JC5025	JC5030	JC5040	JC730U	JC610	CX90	CX75	DX30	KT9
TPMN160308T	9.525	3.18	0.8					•	•	•					
TPMN160312T	9.525	3.18	1.2					•	•	•				•	
TPMN220408T	12.7	4.76	0.8					•	•						
TPMN220412T	12.7	4.76	1.2					•	•	•				•	



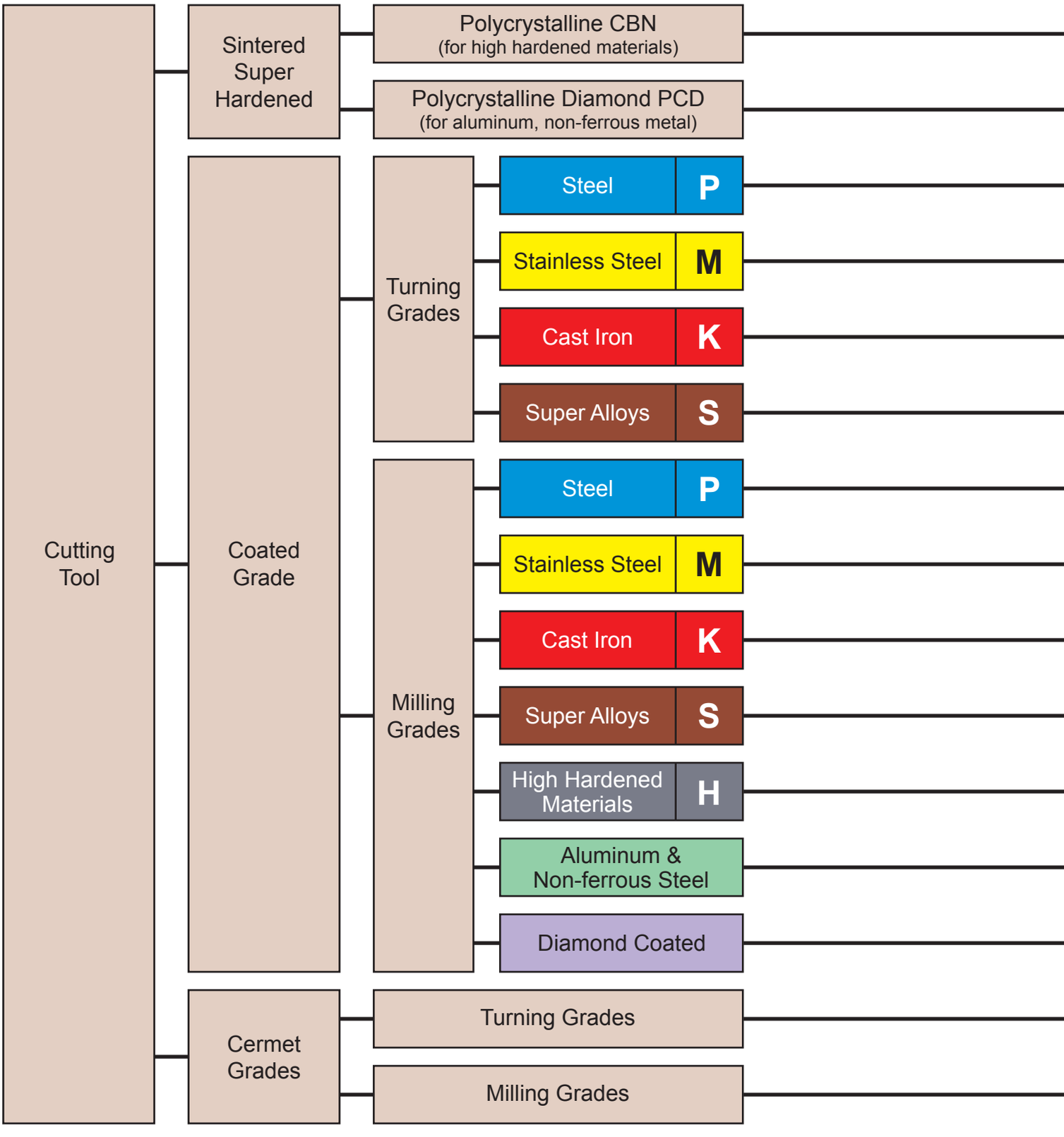
(For Drilling)

CATALOG NUMBER	DIMENSIONS					COATED				CERMET		UNCOATED	
	IC	T	R	Hole		JC215V	JC325V	JC730U	JC610	CX90	CX75	UM30	KT9
WCMX030208	5.56	2.38	0.8	2.8		•	•						
WCMX040208	6.35	2.38	0.8	3.1		•	•						
WCMX050308	7.94	3.18	0.8	3.2		•	•						
WCMX06T308	9.53	3.18	0.8	3.7		•	•						
WCMX080412	12.7	4.76	1.2	4.3		•	•						

DIJET CARBIDE TOOLS

Carbide Grades

Dijet Grades for Cutting Tools



Dijet Grades for Cutting Tools

JBN795 JBN330 JBN300 JBN245

JDA30 JDA735 JDA10 JDA715

JC110V JC215V JC325V JC450V

JC5003 JC110V JC8015 JC5015 JC525X

JC050W JC105V JC110V JC215V

JC5003 JC8015 JC5015

JC8003 JC730U JC8015 JC5015 JC5118 JC5030 JC5040 JC8050

JC730U JC8015 JC5015 JC8050

JC8003 JC605X JC605W JC600 JC610 JC8015 JC5015 JC5080 JC5118

JC8003 JC8015 JC5015 JC5118 JC8050

JC8003 JC8008 JC8015 JC5118

JC10000

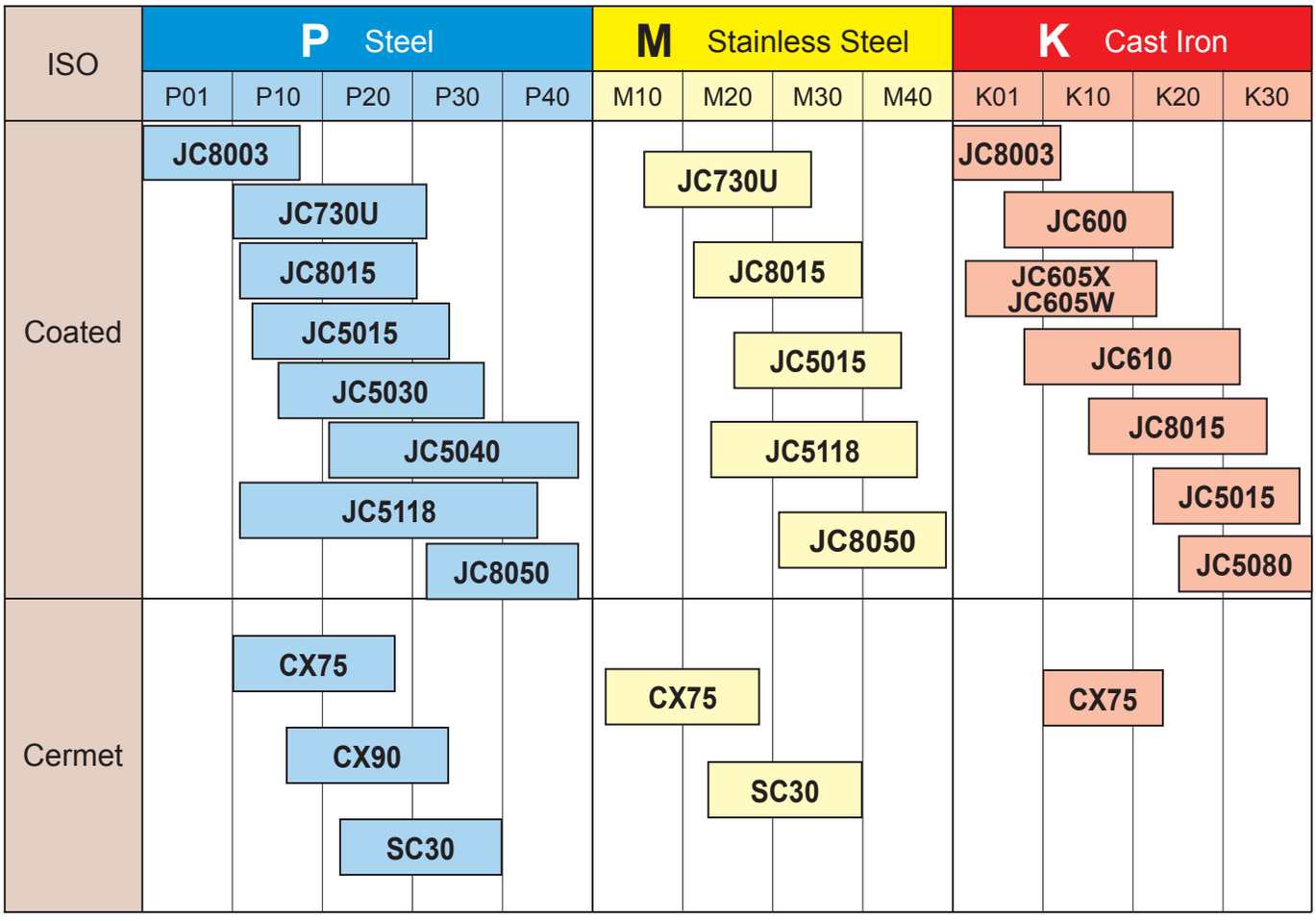
JC20003 JC20015

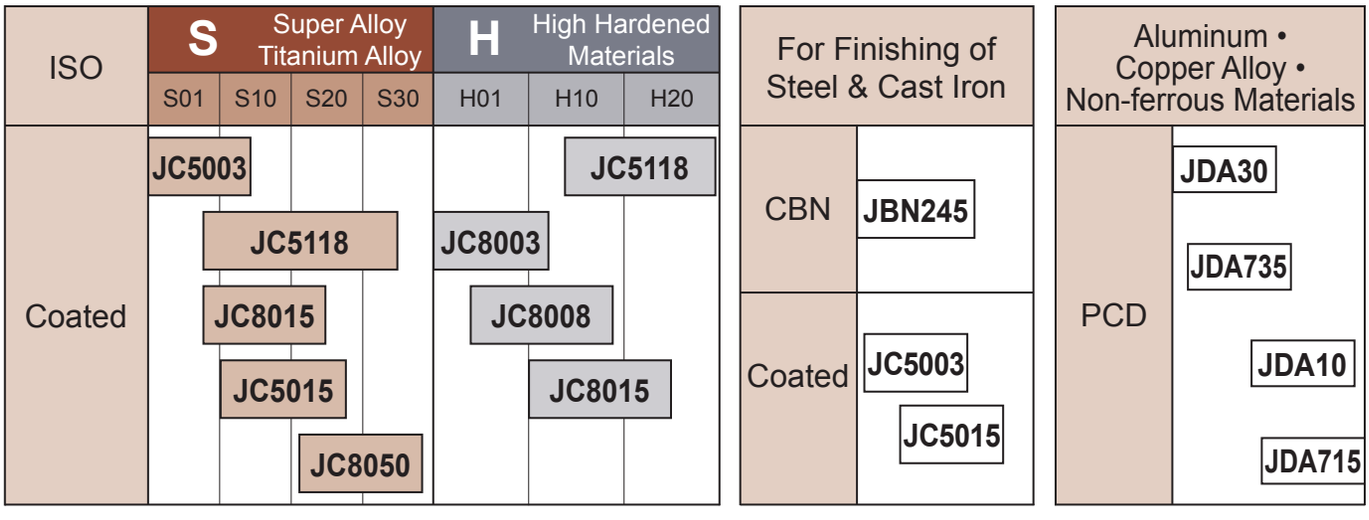
LN10 CX75 PX75 PX90

CX75 CX90 SC30

This is all new - please proofread all copy!

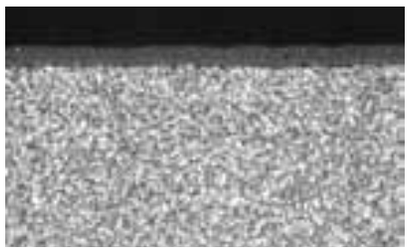
Dijet Grades for Cutting Tools





Milling Coated Grades

Dijet coated milling inserts (DZ coated JC5000 series) are PVD coated on special substrates with excellent wear and chip-resistance giving stable cutting performance even in interrupted machining. Milling inserts (DV coated JC8000 series) are PVD special coating with stable & high-performance on high hardened materials even in high speed dry conditions due to higher hardness & oxidation resistance. This series covers a wide range of applications for milling inserts, drills, and end mills.



Microstructure of **JC8008**

Features & Application

ISO Scale		Grade	Cutting Speed (m/min)	Features
P Steel	Wear Resistant ↕ Tougher	JC8003	200 ~ 300	Extremely excellent wear-resistance. For high speed cutting and high hardened steel up to 65 HRC.
		JC730U	150 ~ 250	CVD coated grade having excellent wear-resistance & thermal crack-resistance. For general steel & stainless steel.
		JC8015	100 ~ 200	Adopted tougher sub-micro grain carbide base material. For general steel, hardened steel and stainless steel.
		JC5015	100 ~ 200	Adopted tougher sub-micro grain carbide base material. Extremely suitable for wet cutting on steel and stainless steel.
		JC5118	100 ~ 200	Adopted tougher sub-micro grain carbide base material. For a wide range of materials from roughing to semi-finishing and HSC.
		JC5030	100 ~ 200	Adopted P-group substrate having good heat-resistance. For general steel and die & mold steel.
		JC5040	100 ~ 200	Adopted M-group substrate having good crack-resistance. For general steel and die & mold steel.
		JC8050	100 ~ 200	Adopted tougher base material, excellent crack & thermal resistance. For interupted cutting on steel, stainless steel, super alloys.
M Stainless Steel	Wear Resistant ↕ Tougher	JC730U	120 ~ 220	CVD coated grade having excellent wear-resistance and thermal crack-resistance. For general steel & stainless steel.
		JC8015	100 ~ 200	Adopted tougher sub-micro grain carbide base material. For general steel, hardened steel and stainless steel.
		JC5015	100 ~ 200	Adopted tougher sub-micro grain carbide base material. Extremely suitable for wet cutting on steel and stainless steel.
		JC5118	100 ~ 200	Adopted tougher sub-micro grain carbide base material. For a wide range of materials from roughing to semi-finishing and HSC.
		JC8050	100 ~ 200	Adopted tougher base material, excellent crack & thermal resistance. For interupted cutting on steel, stainless steel, super alloys.
K Cast Iron	Wear Resistant ↕ Tougher	JC8003	200 ~ 300	Extremely excellent wear-resistance. For high speed cutting and high hardened steel and cast iron.
		JC605X JC605W	150 ~ 250	Improved wear and thermal resistance. For cast iron at high speed milling.
		JC600	150 ~ 250	CVD coated grade having excellent wear-resistance. For gray cast iron & ductile cast iron at high speed cutting.
		JC610	120 ~ 220	CVD coated grade having excellent wear-resistance & crack-resistance General grade for gray cast iron & ductile iron.
		JC5015	100 ~ 200	Adopted tougher sub-micro grain carbide base material. Multi-purpose grade for hardened steel, stainless steel & cast iron.
		JC5080	100 ~ 200	Adopted substrate with improved fracture resistance. For cast iron at high feed machining.
		JC5118	100 ~ 200	Adopted tougher sub-micro grain carbide base material. For a wide range of materials from roughing to semi-finishing and HSC.
S Superalloy Titanium Alloy	Wear Resistant ↕ Tougher	JC8003	30 ~ 40	Extremely excellent wear-resistance. For high speed cutting and high hardened steels.
		JC8015	30 ~ 40	PVD coated grade having excellent wear-resistance. Finishing to light cutting for superalloy or titanium alloy.
		JC5015	20 ~ 30	Adpopted tougher sub-micro grain carbide base material. Light to medium cutting fo superalloy or titanium alloy.
		JC5118	20 ~ 30	Adopted tougher sub-micro grain carbide base material. For a wide range of materials from roughing to semi-finishing and HSC.
		JC8050	20 ~ 50	Adopted New PVD coated grade with tough base material. For interupted cutting for superalloy and stainless steel.
H High Hardened Materials	Wear Resistant ↕ Tougher	JC8003	70 ~ 120	PVD coated grade having excellent wear-resistance. Finishing to light cutting high hardened steels.
		JC8008	60 ~ 110	Adopted New PVD coated grade. Extremely wear-resistant. For high hardened steels.
		JC8015	50 ~ 100	PVD coated grade having excellent wear-resistance. For general steel, hardened steel and stainless steel.
		JC5118	50 ~ 100	Adopted tougher sub-micro grain carbide base material. For a wide range of materials from roughing to semi-finishing adn HSC.

Carbide Grades

Grade Selection Guide for Milling

Material	JC5003	JC730U	JC5015	JC5030	JC5040	JC5080
Carbon Steel / Alloy Steel	○	◎	○	◎	◎	
Die Steel	○		○	◎	◎	
Hardened Steel	○		○		○	
Stainless Steel	○	○	◎			
Gray Cast Iron	○		○			◎
Ductile Cast Iron	○		○			◎
Superalloy / Titanium Alloy	○		○			
High Hardened Steel & Cast Iron	○		○			

◎ = First Choice ○ = Second Choice

Material	JC600	JC605X JC605W	JC610	JC8003	JC8008	JC8015	JC8050	JC5118
Carbon Steel / Alloy Steel				○	○	○	○	○
Die Steel				○	◎	○	○	○
Hardened Steel				○	◎	◎	○	◎
Stainless Steel						◎	◎	◎
Gray Cast Iron	◎	◎	◎			○		○
Ductile Cast Iron	◎	◎	◎			○		○
Superalloy / Titanium Alloy						◎	◎	◎
High Hardened Steel & Cast Iron				◎	◎	○		○

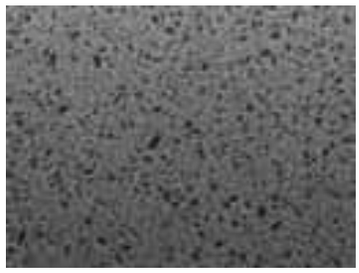
◎ = First Choice ○ = Second Choice

Carbide Grades

Cermet Grades

General Description

The main ingredients of cermet are TiC (titanium carbide), TiN (titanium nitride) and TiCN (titanium carbo-nitride). In comparison with WC (tungsten carbide) whose main ingredients are sintered carbide alloy, the cermet composites show strength and anti-oxidization under high temperature and resists build up on steel materials, therefore, an excellent surface finish can be obtained. These characteristics of cermet make it possible for high speed and high efficient cutting applications. The newer added CX series is for general purpose applications.



Microstructure of **SC30**

Features & Application

Uncoated Grades

Application	Grade	Cutting Speed (m/min)	Features
Turning	LN10	250 ~ 350	Less binding materials for higher wear-resistance. High speed cutting for steel. Finishing for cast iron.
	CX75	150 ~ 250	High nitrogen content & fine uniform hard structure. Excellent chip-resistance & wear-resistance. General purpose for steel.
Milling	CX75	180 ~ 230	High nitrogen content & fine uniform hard structure. Excellent chip-resistance & wear-resistance. Medium & high speed cutting for steel & alloy steel.
	CX90	150 ~ 200	High nitrogen content & fine uniform hard structure. Excellent chip-resistance & wear-resistance. General milling applications for steel & alloy steel.
	SC30	100 ~ 180	Tougher cermet grade having impact resistance by improving binder materials and mircostructure. Roughing applications for steel milling.

Notes: Above data for recommended cutting speed is relevant for machining normal steels.

Coated Grades

Application	Grade	Cutting Speed (m/min)	Features
Turning	PX75	170 ~ 270	Adopted PVD coated grade with good heat-resistance on a base material having good wear-resistance. For high speed turning for carbon steel.
	PX90	170 ~ 220	Adopted PVD coated grade with good heat-resistance on a base material having good crack-resistance. For general turning for carbon steel.

Notes: Above data for recommended cutting speed is relevant for machining normal steels.

Grade Selection Guide

Material	Type of Cutting	Turning				Milling		
		LN10	CX75	PX75	PX90	CX75	CX90	SC30
Carbon Steel Alloy Steel	Finishing	◎		○		○		
	Light Cutting	○	◎	◎	○	◎	○	
	Medium Cutting		◎	◎	◎	○	◎	◎
	Roughing to Heavy		○	○	◎			○
Stainless Steel	Finishing	◎	○	◎		◎		
	Light Cutting		◎		◎	○		◎
	Medium Cutting							○
Cast Iron	Finishing	◎	○					
	Medium Cutting	○	◎			○		
	Roughing							

◎ = First Choice ○ = Second Choice

Carbide Grades

Grade Comparison Chart

ISO Codes			DIJET	Mitsubishi	Tungaloy	Sumitomo	Hitachi	Sandvik	Kennametal	Iscar	Seco
Milling	P	P01	**JC5003**				PTH08M PCA08M PCS08M				
		P10	**JC730U JC5030**			ACP100	JX1005 JX1020 TB6005 PCA12M	GC4220	KC515M KC715M		CP20 F20M F30M F40M
		P20	**JC8015 JC5015 JC5118**	FH7020 F7030 VP15TF		ACP200	JX1015 TB6020 CY150	GC4220 GC4230	KC525M	IC250 IC4050 IC908 IC928 IC950	F20M F25M F40M T20M T25M
		P30	**JC5015 JC5118 JC5040**	F7030 VP15T VP30RT	T3030 GH330 H120 AH330 AH74	ACP300	JX1045 TB6045 CY250 HC844	GC4230 GC4240	KC530M KC725M	IC250 IC328 IC4050 IC908 IC928	F25M T20M T25M T60M CP50
		P40	**JC5040 JC8050**	VP30RT	AH120		JX1060 TB6060 GX2030 GF30	GC4240 GC1030	KC735M KC935M		T25M T60M CP50
	M	M10					PCS08M JX1020 CY9020	GC1025	KC515M		F20M F30M CP20
		M20	**JC730U JC8015**	F7030 VP15TF VP20RT	GH330	ACP200	JX1015 TB6020 CY150	GC1025 GC2030	KC522M KC525M	IC908 IC928	F20M F25M F30M T25M CP50
		M30	**JC8015 JC5015 JC5118**	F7030 VP15TF VP20RT VP30RT	T3030 GH330 AH120	ACP300 EH20Z	JX1045 TB6045 CY250 HC844	GC2030 GC2040	KC530M KC725M	IC328 IC908 IC928	F25M T20M T25M T60M CP50
		M40	**JC8050**	VP30RT	AH140		JC1060 TB6060 GX2030 GF30	GC1030	KC735M KC935M	IC328 IC925	
	K	K01	**JC5003**				PTH08M PCA08M PCS08M			IC910	F15M
		K10	**JC600 JC605X JC605W JC610**	F5010	T1015 AH110 GH110	ACK200	JX1005 TB6005 JX1020 CY9020	GC3020	KC515M	IC418 IC910 IC950	F15M CP20 F20M
		K20	**JC8015 JC5015 JC5118**	F5020 VP15TF VP20RT	AH120	ACK200	JX1015 PTH13S TB6020 CY150	GC3020 GC3220	KC520M KC522M KC915M	IC4050 IC908 IC910 IC950 IC418	T150M T20M CP20
		K30	**JC5015 JC5080**	VP15TF VP20R		ACK300 EH20Z	JX1045 TB6045 PT30E CY250	GC3040	KC935M	IC328 IC4050 IC908 IC950	
	S	S01	**JC5003**								
		S10	**JC8015**	VP15TF	AH110	EH20Z EH520Z	PCS08M	GC1025 GC1030	KC510M KC515M		
		S20	**JC5015 JC5118**	VP15TF	AH120		PTH13S	GC2030	KC522M KC525M		
		S30	**JC8050**					GC2040	KC530M KC725M		
	H	H01	**JC8003**				PTH08M				
		H10	**JC8008**	VP15TF			JX1005 TB6005		KC515M		
		H20	**JC8015 JC5118**	VP15TF				GC4020	KC522M		

Carbide Grades

Grade Comparison Chart

ISO Codes			DIJET	Mitsubishi	Tungaloy	Sumitomo	Hitachi	Sandvik	Kennametal	Iscar	Seco
Turning	P	P01	**JC110V**	UE6005	T9005	AC700G	GM8010	GC4205	KC9315	IC520N	TP05 TX100
		P10	**JC110V** **JC215V**	UE6005 UE6110 UE6010 UE6020 UC6010 VP10MF	T9005 T9015 AH710	AC700G AC2000	HG8010 GM8015	GC4205 GC4215	KC9110 KC9315 KC5010 KC5510 KU10T	IC520N IC9015	TP15 TP100 CP20
		P20	**JC110V** **JC215V**	UE6110 UE6010 UE6020 UC6010 VP15F VP20MF	T9015 T9025 AH710	AC2000	GM8020 HG8025	GC4215 GC4225 GC1025 GC2015	KC9125 KC9225 KC9325 KU10T KU25T KU30T KC5010 KC5025 KC5510 KC5525	IC520N IC9015 IC908 IC950	TP100 TP200 TP15 TP25 CP25
		P30	**JC215V** **JC325V**	UE6035 UH6400 US735 VP15F VP20MF	T6025 T9035 GH730	AC3000 AC630M	HG8025 GM25 HG8035 GM8035	GC4225 GC4235 GC1025 GC2015 GC2025	KC8050 KC9040 KC9125 KC9140 KU25T KU30T KC5025 KC5525	IC9025 IC4050 IC908 IC950	TP200 TP300 TP30 TP35 CP50
		P40	**JC325V** **JC450V**	UE6035 UH6400 US735	T9035	AC3000 AC630M	GX30	GC4235 GC2025 GC235	KC9040 KC9140 KC9240 KC9245 KU30T	IC3028 IC328	TP40 TP300 CP50
	M	M10	**JC5003** **JC110V**	US7020 VP10MF	T9015	EH10Z EH510Z	GM10	GC2015 GC1025	KC5010 KC5510 KU10T	IC907	TP100 TP15 CP20
		M20	**JC110V** **JC8015**	US7020 VP15TF VP20MF	T6020 T9025 GH330 GH730	AC610M EH20Z EH520Z	GM8020 HG8025 GM25	GC2015 GC1025 GC2025	KC8050 KC9225 KC5010 KC5025 KC5510 KC5525 KU10T KU25T	IC520M IC908 IC928	TP200 TP300 TP15 TP200 TP25
		M30	**JC5015** **JC525X**	US735 VP15TF VP20MF	T6030	AC630M AC3000 AC530U	GM25 HG8035 GM8035	GC2025 GC2035 GC235	KC8050 KC9240 KU25T KU30T KC5025 KC5525	IC520M IC3028 IC908	TP300 TP35 TP40 CP50
		M40	**JC525X**	US735		AC630M AC530U	GX30		KC9240 KC9245	IC3028	TP40
	K	K01	**JC105V** **JC050W**	UC5105	T5105 T5010	AC410K AC300G	GM3005	GC3025		IC9007 IC910	TP05 TX100
		K10	**JC105V** **JC110V**	UC5115	T5105 T5115 T5010 T5020	AC410K EH10Z	GM3005 HG3315 HG8010	GC3205 GC3210	KC9315 KC5010 KC5510 KU10T	IC9007 IC9015 IC910 IC450	TX150 TP05 TP10 CP20
		K20	**JC110V** **JC215V**	UC5115 VP15TF	T5125 T5020 T5115	AC700G EH20Z AC530U	HG8010 GM8015 GM8020 HG8025	GC3210 GC3215	KC9110 KC9325 KU10T KU25T KC5010 KC5025 KC5510 KC5525	IC9015 IC8048 IC450 IC908	TX150 TP200 TP15 TP25 CP20
		K30	**JC215V**	VP15TF	T5125		GM8020 GM8025		KC8050 KC9215 KC5025 KU30T	IC9015 IC4050	TP200 TP20 TP25 CP50
	S	S01	**JC5003**	VP05RT	AH1110						
		S10	**JC8015**	VP05RT VP10RT	AH120	EH10Z EH510Z		GC1005 GC1105	KC5010 KC5510 KU10T		
		S20	**JC5015**	VP10RT VP15TF		AC610M EH20Z EH520Z		GC1025	KC5025 KC5225 KU10T KU25T		

Carbide Grades

Grade Comparison Chart

ISO Codes			DIJET	Mitsubishi	Tungaloy	Sumitomo	Hitachi	Sandvik	Kennametal	Iscar	Seco
Cermets	P	P01	**LN10**	AP25N	GT720 NS520 GT520	T110A T2000Z	MZ1000	CT5015		IC20N	
		P10	**LN10** **CX75** **PX75**	AP25N NX2525	GT720 GT730 NS520 AT530	T1200A T2000Z T250A	MZ1000 CH550	CT5015 GC1525	KT530M KT315	IC20N IC30 IC520N IC530N	C15M
		P20	**CX75** **CX90** **PX90**	AP25N UP35N NX2525 NX3035	NS730 GT730 NS530 GT530	T1200A T2000Z T3000Z T250A	CZ25 CH550 MZ2000 CH7030	GC1525 CT530		IC30N IC75T	C15M
		P30	**CX90** **SC30**	VP45N NX4545	NS730 NS740 NS530 NS540	T3000Z	CZ25 MZ3000 CH7035			IC75T	
	M	M10	**LN10** **CX75**	NX2525 AP25N	GT730 NS520 AT530 GT530	T1200A	MZ1000 CH550	GC1525	KT530M KT315		
		M20	**CX75** **PX75**	NX2525 AP25N NX3035	NS730 NS530	T250A	CZ25 MZ2000 CH7030	CT530			C15M
		M30	**PX90** **SC30**	NX4545	NS740 NS540		CZ25 MZ3000 CH7035				C15M
	K	K01	**LN10**	AP25N NX2525	GT720 NS520 AT520 GT520	T110A T1200A	MZ1000	CT5015			
		K10	**LN10** **CX75**	AP25N NX2525	GT730 NS730 NS530 GT530	T1200A	MZ1000 CH550	CT5015	KT315		
		K20	**CX75**	AP25N NX2525			CZ25 MZ2000 CH7030				
		K30					MZ3000 CH7035				

DIJET CARBIDE TOOLS

Technical Information

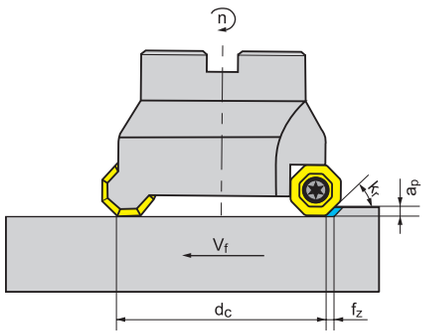
Technical Information

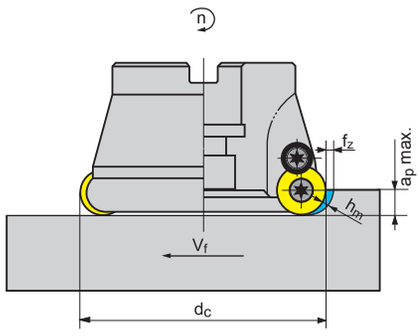
Terminology and Formulas (for milling)

D_c	= Cutting diameter	mm.	Z_c	= Effective number of teeth	
a_e	= Cutting width (step)	mm.	h_{ex}	= Max chip thickness	mm.
a_p	= Depth of cut	mm.	h_m	= Average chip thickness	mm.
f_n	= Feed rate per revolution	mm.	k_{c1}	= Specific cutting force (h_{ex} = 1mm)	N/mm^2.
f_z	= Feed rate per tooth	mm.	P_c	= Net cutting power	KW.
D_e	= Effective cutting diameter	mm.	k_r	= Major cutting edge angle	deg.
V_c	= Cutting speed	m/mm.	V_{co}	= Constant for cutting speed	
Q	= Metal removal rate	cm3/min.	C_{vc}	= Correction factor for cutting speed	
l	= Machined length	mm.	n	= Spindle speed	rev/min.
V_f	= Table feed (feed rate)	mm/min.	n_{mt}	= Efficiency	KW
Da_p	= Max cutting diameter at specific depth	mm.	m_c	= Rise in specific cuting force (k_c) as a function of chip thickness	
Z_n	= Total number of edges in the tool				

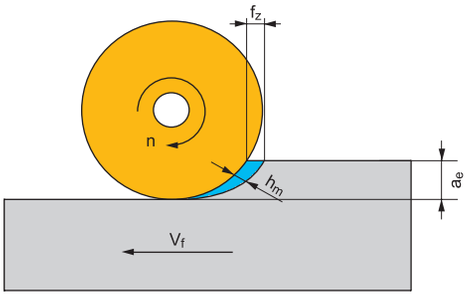
General formulas

Cutting speed	$V_c = \frac{\pi \times D_c \times n}{1000}$ = m/min.	Spindle speed	$n = \frac{V_c \times 1000}{\pi \times D_c}$ = rev/min.
Table feed (feed speed)	$V_f = f_z \times n \times z_n$ = mm/min.	Feed per tooth	$f_z = \frac{V_f}{n \times z_n}$ = mm.
Feed per revolution	$f_n = \frac{V_f}{n}$ = mm/rev.	Removal rate	$Q = \frac{a_p \times a_e \times V_f}{1000}$ = cm^3.
Specific cutting force	$k_c = k_{c1} \times h_{nm}^{-mc}$ = mm/min.	Effective cutting diameter	$D_e = 2 \times \sqrt{a_p \times (D_c - a_p)}$ = mm.
Average chip thickness (side & facemilling) when $a_e / D_c \leq 0.1$	$h_m = f_z \sqrt{\frac{a_e}{D_c}}$ = mm.	Net power	$P_c = \frac{a_p \times a_e \times V_f \times k_c}{60 \times 10^6 \times n_{mt}}$ = KW
Average chip thickness when $a_e / D_c \geq 0.1$	$h_m = \frac{\sin k_r \times 180 \times a_e \times f_z}{\pi \times D_c \times \arcsin\left(\frac{a_e}{D_c}\right)}$ = mm.	Cutting time	$T_c = \frac{l}{V_f}$ = min.





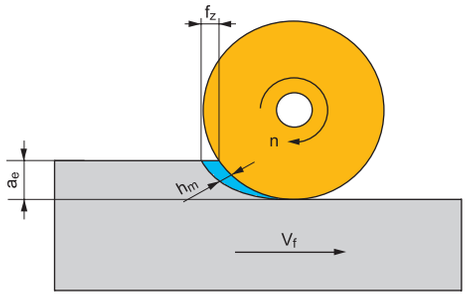
Up Cut and Down Cut



Down Milling:

- same workpiece direction, feed rate and rotation of milling cutter.
- chip cross-section start on the strongest point.

Generally down milling should be prefered if rigid machine is available.

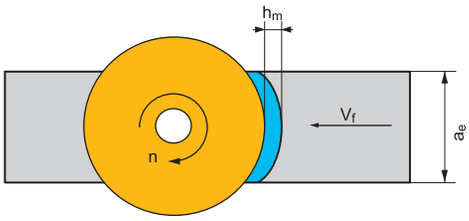


Up Milling:

- the feed rate of workpiece is counter-clock-wise to the sense of milling cutter rotation.
- chip cross-section starts on the weakest point.

Up milling should be applied on instable milling machine and workpiece materials with higher hardness.

Tool with central work piece

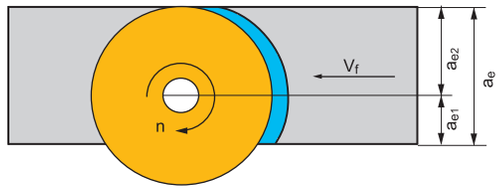


Formulas:

$$h_m = \frac{\sin(k_r) \times 180 \times a_e \times f_z}{\pi \times d_c \times \arcsin\left(\frac{a_e}{d_c}\right)}$$

$$f_z = \frac{h_m \times \pi \times \arcsin\left(\frac{a_e}{d_c}\right)}{\sin(k_r) \times 180 \times a_e}$$

Tool with outside center work piece



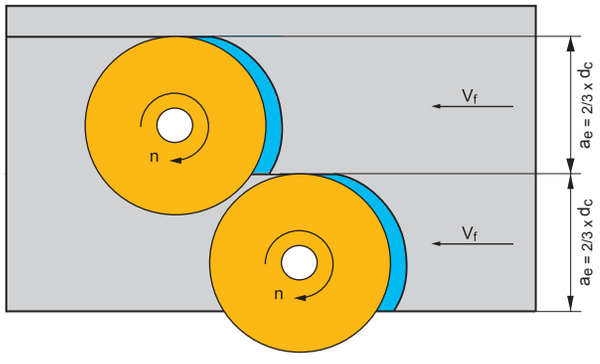
Formulas:

$$h_m = \frac{\sin(k_r) \times 360 \times a_e \times f_z}{\pi \times d_c \times \left[\arcsin\left(\frac{2xa_{e1}}{d_c}\right) + \arcsin\left(\frac{2xa_{e2}}{d_c}\right)\right]}$$

$$f_z = \frac{h_m \times \pi \times d_c \times \left[\arcsin\left(\frac{2xa_{e1}}{d_c}\right) + \arcsin\left(\frac{2xa_{e2}}{d_c}\right)\right]}{\sin(k_r) \times 360 \times a_e}$$

Suggested milling operation

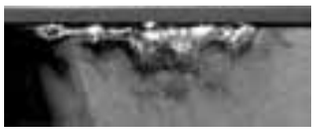
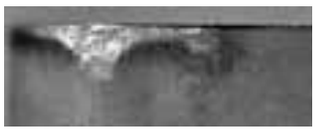
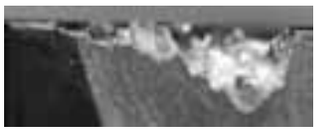
We suggest to work like this when possible or in any case work with tangential tool exit. Up cut and down cut is possible with Ae Max. 2/3 of tool diameter.



Technical Information

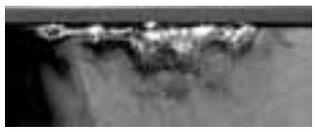
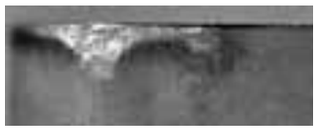
APPLICATIONS
Turning

Troubleshooting

PROBLEM	CAUSE	RECOMMENDED ACTION
Chipping 	• insert grade • speeds & feeds • others	• Change to tougher grade • Increase SFM if chipping is on trailing edge • Decrease SFM if chipping is on leading edge • Adjust chip load • Minimize tool overhang • Check for insert movement/check clamp
Flank Wear 	• insert grade • speeds & feeds	• Change to more wear-resistant grade • Decrease SFM
Crater Wear 	• insert grade • insert shape • speeds & feeds • others	• Change to more crater wear-resistant grade • Change breaker • Use positive rake insert • Decrease SFM • Adjust chip load
Broken Nose 	• insert grade • insert shape • others	• Change to tougher grade • Use larger nose radius if allowable • Increase hone size • Adjust chip load
Built-up Edge 	• insert grade • insert shape • speeds & feeds • others	• Change to tougher grade • Adjust hone size • Increase SFM • Adjust depth of cut per pass • Increase coolant concentration and/or flow
Deformation 	• insert grade • speeds & feeds	• Change more heat-resistant grade • Decrease SFM

APPLICATIONS
Milling

Troubleshooting

PROBLEM	CAUSE	RECOMMENDED ACTION
Chipping 	• insert grade • speeds & feeds	• Change to tougher grade • Increase the cutting speed • Reduce the feed/tooth
Flank Wear 	• insert grade • speeds & feeds	• Use a more wear-resistant grade • Reduce the cutting speed • Increase the feed/tooth
Crater Wear 	• insert grade • speeds & feeds	• Use a more crater wear-resistant grade • Reduce the cutting speed • Reduce the feed/tooth
Broken Nose 	• insert grade • speeds & feeds • insert shape	• Use a tougher grade • Adjust the cutting speed • Adjust the feed/tooth • Use a thicker insert
Poor Surface Finish	• insert grade • speeds & feeds • insert shape • tool shape	• Use a more wear-resistant grade • Increase the cutting speed • Use a polished insert • Use a higher rake cutter
Burrs, Chipping, etc.	• insert grade • tool shape	• Increase the cutting speed • Reduce the feed/tooth • Use a higher rake cutter
Vibration	• speeds & feeds	• Reduce the cutting speed • Reduce the feed/tooth

Technical Information

APPLICATIONS
Drilling

Troubleshooting

PROBLEM	CAUSE	RECOMMENDED ACTION
Drill Breakage	• speeds & feeds • cutting fluid • others	• Maintain constant feed rate • Reduce the cutting speed • Reduce the feed rate • Increase coolant flow • Use a machine with sufficient horsepower • Tighten workpiece clamping
Center Point Breakage	• tool • speeds & feeds • others	• Reduce drill overhang • Maintain constant feed rate • Reduce the feed rate when starting drill • Use a machine with sufficient horsepower • Tighten work piece clamping
Peripheral Cutting Edge Breakage	• tool • speeds & feeds • others	• Reduce drill overhang • Maintain constant feed rate • Reduce the cutting speed • Use a machine with sufficient horsepower • Tighten workpiece clamping
Chipping	• tool • speeds & feeds • cutting fluid • others	• Reduce drill overhang • Maintain constant feed rate • Change the feed rate • Increase coolant flow • Use a machine with sufficient horsepower • Tighten workpiece clamping
Long Stringy Chips	• tool • speeds & feeds	• Less lead angle • Increase hone • Maintain constant feed rate • Increase the feed rate
Chip Form Varies	• speeds & feeds • cutting fluid • others	• Maintain constant feed rate • Maintain constant coolant flow • Use a machine with sufficient horsepower

Technical Information

APPLICATIONS
Drilling

Troubleshooting

PROBLEM	CAUSE	RECOMMENDED ACTION
Over Size or Out-of-Round	• tool • speeds & feeds • others	• Reduce drill overhang • Increase lead angle • Increase the cutting speed • Reduce the feed rate • Use a machine with sufficient horsepower • Tighten workpiece clamping
Poor Surface Finish	• speeds & feeds • others	• Maintain constant feed rate • Increase the cutting speed • Reduce the feed rate • Use low feed rate when starting drill • Use a machine with sufficient horsepower • Tighten workpiece clamping
Galling on Drill Body	• tool • speeds & feeds • others	• Reduce drill overhang • Reduce the cutting speed • Increase the feed rate • Use a machine with sufficient horsepower • Tighten workpiece clamping
Vibration	• tool • speeds & feeds • others	• Use light hone • Reduce drill overhang • Maintain constant feed rate • Use a machine with sufficient horsepower • Tighten workpiece clamping

Material Cross Reference

• Carbon Steel & Alloy Steel

TYPE		JIS	DIN
Carbon Steel	1010	S10C	C10
	1015	S15C	C15
	1020	S20C	C22
	1025	S25C	C25
	1030	S30C	C30
	1035	S35C	C35
	1040	S40C	C40
	1045	S45C	C45
	1050	S50C	C50
	1055	S55C	C55
	1060	S58C	C60
	1010	S09CK	CK10
	1015	S15CK	CK15
	1020	S20CK	CK22
Nickel Chromium Molybdenum Steel	8620	SNCM220	
	8640	SNCM240	
	4320	SNCM420	
	4340	SNCM439	
Chromium Steel	5130	SCr430	
	5135	SCr435	34Cr4
	5140	SCr440	42Cr4
	5147	SCr445	
Chromium Molybdenum Steel	4130	SCM430	
	4135	SCM435	34CrMo4
	4140	SCM440	42CrMo4
	4145	SCM445	
Manganese Steel and Manganese Chromium Steel	1520	SMn420	
	1536	SMn433	
	1541	SMn438	
		SMnC420	
		SMnC443	
Structural Steel with Quenching Property Guaranteed (H Steel)	1522H	SMn420H	
	1541H	SMn438H	
	5120H	SCr420H	
	5130H	SCr430H	34Cr4
	5135H	SCr435H	37Cr4
	5140H	SCr440H	41Cr4
	4135H	SCM435H	34CrMo4
	4140H	SCM440H	42CrMo4
	4145H	SCM445H	
	8620H	SNCM220H	
	4320H	SNCM420H	

• Tool Steel

TYPE		JIS	DIN
Carbon Tool Steel	W1-13	SK1	
	W1-11 1/2	SK2	
	W1-10	SK2	C105W1
	W1-9	SK4	
	W1-8	SK5	C80W1
	W1-7	SK6	C80W1
		SK7	C70W2
High Speed Steel	T1	SKH2	
	T4	SKH3	
	T15	SKH10	
	M2	SKH51	S6-5-2
	M3-1	SKH52	
	M3-2	SKH53	S6-5-3
	M4	SKH54	
	M36	SKH56	
	M7	SKH58	
	M42	SKH59	S2-10-1-8
Alloy Tool Steel	F2	SKS11	105WCr6
	L6	SKS51	
	W2-9 1/2	SKS43	
	W2-8 1/2	SKS44	
	D3	SKD1	X210Cr12
	D2	SKD11	
	A2	SKD12	
	H11	SKD6	38CrMoV5
	H13	SKD61	40CrMoV5
	P20		40CrMnMo7

• Stainless Steel

TYPE		JIS	DIN
Austenitic	AISI 201	SUS 201	
	AISI 202	SUS 202	
	AISI 301	SUS 301	
	AISI 302	SUS 302	
	AISI 302B	SUS 302B	
	AISI 303	SUS 303	DINX10 CrNiS189
	AISI 303Se	SUS 303Se	
	AISI 304	SUS 304	DINX5 CrNi1810
	AISI 304L	SUS 304L	DINX2 CrNi1911
	AISI 304N	SUS 304N1	
	AISI 305	SUS 305	DINX2 CrNi1812
	AISI 308	SUS 308	
	AISI 309S	SUS 309S	
	AISI 310S	SUS 310S	
	AISI 316	SUS 316	DINX2 CrNiMo17122
	AISI 316L	SUS 316L	DINX2 CrNiMo17132
	AISI 316N	SUS 316N	
	AISI 317	SUS 317	
	AISI 317L	SUS 317L	DINX2 CrNiMo18164
	AISI 321	SUS 321	DINX6 CrNiTi1810
	AISI 347	SUS 347	DINX6 CrNiNb1810
	AISI 384	SUS 384	
	ASTMXM7	SUSXM7	
	ASTMXM15	SUSXM15J1	
Ferritic	AISI 405	SUS 405	DINX6 CrAl13
	AISI 429	SUS 429	
	AISI 430	SUS 430	DINX6 Cr17
	AISI 430F	SUS 430F	DINX12 CrMoS17
	AISI 434	SUS 434	DINX6 CrNb17
	ASTMXM27	SUS XM27	
Martensitic	AISI 403	SUS 403	
	AISI 410	SUS 410	DINX10 Cr13
	AISI 410S	SUS 410S	DINX6 Cr13
	AISI 416	SUS 416	
	AISI 420	SUS 420	DINX20 Cr13
	AISI 420F	SUS 420F	
	AISI 431	SUS 431	DINX20 CrNi172
	AISI 440A	SUS 440A	
	AISI 440B	SUS 440B	
	AISI 440C	SUS 440C	
	ASTM440F	SUS 440F	
	ASTM 631	SUS 631	DINX7 CrNiA1177
	AISI 632	SUS 632	

Material Cross Reference

• *Heat Resistant Steel*

TYPE	AISI ASTM	JIS	DIN
Austenitic	AISI 309	SUH 309	
	AISI 310	SUH 310	INCrNi252
	AISI 330	SUH 330	
	ASTM660	SUH 0	
	ASTM661	SUH 61	
Ferritic	AISI 409	SUH 409	INX6CrTi1
	AISI 446	SUH 446	
Martensitic		SUH 1	
		SUH 3	
		SUH 4	
		SUH 11	
		SUH 600	
	ASTM616	SUH 616	

• *Cast Iron*

TYPE	AISI ASTM	JIS	DIN
Gray Cast Iron	A48-20B	FC100	GG-10
	A48-25B	FC150	GG-15
	A48-30B	FC200	GG-20
	A48-35B	FC250	GG-25
	A48-40B	FC300	GG-30
	A48-50B	FC350	GG-35
Ductile Cast Iron	60-40-18	FCD400	GGG-40
	65-45-12	FCD500	GGG-50
	80-55-06	FCD600	GGG-60
	100-70-03	FCD700	GGG-70

Technical Information

Chemical Components

		MATERIAL	C	Mn	Si	Cr	Ni	Co	Mo	W	Cb	Ti	Al	B	Fe	OTHER
Heat-Resistant Alloys	Fe Base	A-286	0.05	1.40	0.99	15.00	26.00	-	1.30	-	-	2.00	0.20	0.003	54.00	0.30 V
		M-308 (J-1300)	0.08			14.00	33.00		4.00	6.50		2.00	0.25		40.00	0.25 ZR
		16-25-6 (Timkin)	0.10	1.40	0.77	16.00	25.00		6.00						5.00	0.15 N
		Chromalloy (Unitemp 14 CMV)	0.20			1.00			1.00						97.70	0.12 V
		Lapelloy	0.30			11.50	0.35		2.75						85.00	0.25 V
		Am-355	0.13	0.75	0.35	15.50	4.50		2.85						75.80	0.11 N
		Discaloy	0.05	0.60	0.90	13.00	26.00		3.00			1.80	0.20		54.00	
		Tinadur	0.08			15.00	30.00					1.75	0.40		53.00	1.00 Ta
		N-155 (Multimet)	0.10	1.50	0.70	21.00	20.00	19.50	3.00	2.40	1.10	1.00			30.00	0.13 N
		19-9 DL	0.30	1.00	0.60	19.00	9.00		1.40	1.30	0.40	0.30			66.00	
		S-588	0.40	1.50	0.80	18.00	20.00		4.00	4.00	4.00				47.00	
		W545	0.04	1.50	0.40	13.00	26.00		1.50			2.80	0.20	0.080	54.80	
		Unitemp 212	0.08			16.00	25.00				0.50	4.00	0.35		54.00	0.06 BR
																0.05 ZR
		S-590	0.45	1.50	1.00	20.00	20.00	20.00	4.00	4.00	4.00				26.50	
		Unitemp 1415NW (Greek Ascoloy)	0.18			13.00	2.00			3.00					81.80	
		V-57	0.08	0.25	0.55	14.75	25.50		1.25			3.00	0.25	0.008	54.10	0.30 V
		H46	0.17			12.00	0.45		0.65		0.40				58.90	0.35 V
																0.05 N
		H53	0.08			10.50	0.25	7.00	0.80	0.80	0.45				79.60	0.55 V
		EME	0.10	0.50	0.70	19.00	12.00			3.20	1.20				63.00	0.15 N
		Unimach #1	0.40		0.90	5.00			1.30						91.90	0.50 V
		Almar 362	0.03	0.30	0.20	14.50	6.50					0.80			77.60	
		Custom 455	0.03	0.50	0.50	11.75	9.00				0.30	1.20			74.40	2.25 Cu
		Incoloy 800	0.04	0.75	0.35	21.00	32.50					0.37	0.37		46.00	0.30 Cu
		Incoloy 801	0.04	0.75	0.35	20.50	32.00					1.12			44.50	0.15 Cu
	Ni Base	Rene 41	0.10	0.30	0.30	19.00	53.00	11.00	10.00			32.00	1.60	0.005	2.00	
		M-452 (J-1500)	0.10	1.00	0.70	19.00	54.00	10.00	10.00			2.50	0.80	0.005	2.00	
		Waspaloy	0.05	0.70	0.40	19.00	58.00	14.00	4.50			2.50	1.20	0.005	2.00	0.06 ZR
		Udimet 500	0.05	0.70	0.30	19.00	47.00	18.00	4.00			3.00	3.00	0.005	2.00	0.05 ZR
		Inconel X	0.04	0.70	0.30	15.00	73.00				0.90	2.50	0.90		7.00	
		Nimonic 80A	0.05	0.70	0.50	20.00	76.00					2.30	1.00		0.50	
		Nimonic 90	0.08	0.50	0.40	20.00	58.00	16.00				2.30	1.40		0.50	
		DCM	0.05			14.30	61.00		5.30			3.40	4.30	0.080	4.60	
		Hastelloy B	0.05	1.00	1.00	1.00	60.00	2.50	28.00						5.50	0.40 V
		Hastelloy C	0.08	1.00	1.00	15.50	54.00	2.50	16.00	3.75					5.50	0.35 V
		Hastelloy R-235	0.15			15.50	62.00	2.50	5.50			2.50	2.00		10.00	
		Hastelloy X	0.10	1.00	1.00	22.00	36.00	1.50	9.00	0.60					18.50	
		Hastelloy W	0.15			22.00	45.00		9.00						24.00	0.30 V
		Inconel (600)	0.04	0.40	0.20	15.50	76.00								7.00	
		Incoloy 901	0.05	0.48	0.22	12.80	43.00		5.70			2.50			35.30	
		Nimonic 75	0.12	0.40	0.60	20.00	76.00					0.40	0.06		2.40	0.05 Cu
		Nimonic 80A	0.05	0.70	0.50	20.00	76.00					2.30	1.00		0.50	0.05 Cu
		Inconel 700	0.13	0.08	0.25	15.00	46.00	29.00	3.00			2.20	3.20		0.80	
		K-42-B	0.05	0.70	0.70	18.00	43.00	22.00				2.50	0.20		13.00	
		Inconel 713C	0.12	0.15	0.40	13.00	72.00		4.50		2.25	0.60	6.00		1.00	
		Inconel 718	0.04	0.20	0.30	19.00	52.00		3.00		5.20	0.90	0.50		18.50	0.05 Cu
																5.02 Ta
		Allvac 620	0.05			19.00	57.00	12.00	6.00	1.00		3.00	2.00	0.010		
		Pyromet 860	0.10	1.00	1.00	16.00	48.00	4.00	9.00	0.60		3.00	1.30	0.010	18.50	
		Inconel X-750	0.04	0.70	0.25	15.50	73.00				0.95	2.50	0.70		7.00	0.50 Cu
		Astroloy	0.06			15.00	54.60	18.00	3.30			3.50	4.50	0.050		
		Inconel 713	0.13			12.00	75.00		5.50		2.00	0.60	6.00			
		Monel 713y 400	0.12	0.90	0.15		66.00								1.35	31.50 Cu
		Monel Alloy R405	0.18	0.90	0.15		66.00					0.50	2.75		1.35	31.50 Cu
		Monel Alloy K-500	0.15	0.60	0.15		65.00					0.50	2.80		1.00	29.50 Cu
		Monel Alloy K-500 (aged)	0.15	0.60	0.15		65.00					0.50	2.80		1.00	29.50 Cu
		Inconel 625	0.05	0.15	0.30	22.00	61.00		9.00		4.00	0.20	0.20		3.00	3.65 Ta
																0.10 Cu
		Permanickel Alloy 300	0.25	0.10	0.06		98.60					0.50			0.10	0.02 Cu
																0.35 Mg
		Duranickel Alloy 301	0.15	0.25	0.55		94.00					0.50	4.50		0.15	0.05 Cu
		Refractaloy 26	0.03	0.80	1.00	18.00	38.00	30.00	3.20			2.60	0.20		6.17	
		Udimet 700	0.06	1.00	0.10	15.00	56.40	18.45	5.25			3.50	4.25	0.030	0.50	
		Colmonoy 4	0.45		2.25	10.00	82.80							2.000	2.50	
		Colmonoy 5	0.65		3.75	11.50	80.00							2.500	4.25	
		Colmonoy 20	0.25		3.00	5.00	88.25							1.000	3.50	
		Colmonoy 21	0.25		3.25	5.00	90.50							1.250	1.00	
		Colmonoy 22	0.12		3.40		95.50							1.350	1.00	

Chemical Components

	MATERIAL	C	Mn	Si	Cr	Ni	Co	Mo	W	Cb	Ti	Al	B	Fe	OTHER
Co Base	J-1570	0.20	5.00		20.00	30.00	39.00		6.50		4.10				
	J-1650	0.20			19.00	27.00	36.00		12.00		3.80		0.020		2.00 Ta
	S-816	0.38	1.50	0.70	20.00	20.00	43.00	4.00	4.00	4.00				3.00	
	L-605(HS-25)	0.12	1.50	1.00	20.00	10.00	51.00		15.00					1.00	
	HS-21 (Vitallium)	0.25	0.60	0.60	27.00	3.00	62.00	5.00						1.00	
	HS-31 (X-40)	0.40	0.60	0.60	25.00	10.00	55.00		8.00					1.00	
	HS-30 (422-19)	0.40	0.60	0.60	24.00	16.00	51.00	6.00						1.00	
	HS-27	0.40		0.60	23.00	2.00	67.00	6.00						1.00	
	WI 52	0.45	5.00	0.50	21.00	1.00	61.70		11.00	2.00				1.70	0.04 P
															0.04 S
	Wallex #6 (Colmonoy)	1.00		1.25	29.00		64.30		4.50						
	Jetalloy 209	0.02			20.00	10.00	50.00		15.00		2.00			1.00	
	Nivco	0.02	0.35	0.15	0.50	22.50	73.50				1.80	0.22		0.30	1.10 ZR
															0.01 S
	Stellite J	2.20	1.00	1.00	31.00	2.50	43.30		16.00					3.00	
Titanium Alloys	Commercially Pure (annealed)														
	110-170 BHN										99.50				
	140-200 BHN										99.20				
	200-275 BHN										99.00				
	ALPHA														
	Ti-5AL-2.5 Sn (annealed)										92.50	5.00			2.50 Sn
	Ti-6AL-1V-4Zr (annealed)										89.00	6.00			4.00 Zr
															1.00 V
	Ti-7AL-2Cb-1Ta (annealed)										90.00	7.00			2.00 Cb
															1.00 Ta
	Ti-8AL-1Mo-1V (heat treated)										90.00	8.00			1.00 Mo
	290-335-BHN														1.00 V
	Alpha-bata														
	Ti-6AL-4V (annealed)										90.00	6.00			4.00 V
	Ti-4AL-4Mn (annealed)		4.00								92.00	4.00			
	Ti-2Fe-1Cr-2Mo (annealed)				2.00			2.00			94.00			2.00	
	Ti-7AL-4Mo (annealed)							4.00			89.00	7.00			
	Ti-1Al-8V-5Fe (annealed)										86.00	1.00		5.00	8.00 V
	Alpha-bete														
	Ti-6AL-6V-25M-1 (Fe, Cu)										87.00	6.00			1.00 Fe
	(Annealed)														Cu
															6.00 V
	Ti-8AL-1Mo-1v							1.00			90.00	8.00			
	Beta														
	Ti-13V-11Cr-3AL (solution treated)				11.00						73.00	3.00			13.00 V
Other Cut Resistant Materials	COLUMBIUM (Cb)														
	D-31							10.00	15.00	80.00	10.00				1.00 Zr
	F-48							5.00	10.00	79.00					5.00 Zr
	Cb-74								10.00	85.00					10.00 Hf
	Cb-129								15.00	80.00					2.00 Ta
	Cb-132M	0.001						5.00	15.00	58.50					1.50 Zr
															2.50 Zr
	Cb-752								10.00	87.50					1.00 Zr
	1% Zr									99.00					
	TUNGSTEN (W)														
	W-Forged Rolled								99.90						
	W-Sintered (28-35 Rc)								99.90						
	W-10					7.50			90.00						
	W-2					2.50			97.50						2.50 Cu
	TANTALUM (Ta)														
	Ta-10W								10.00						90.00 Ta
	T-111								8.00						90.00 Ta
															2.00 Hf
	T-222								10.00						87.50 Ta
															2.50 Hf
	Ta	0.01													99.80
	MOLYBDENUM (Mo)														
	Molybdenum	0.15						99.80							
	TZM							99.40			0.50				0.08 Zr
	TZC	0.12						98.40			1.25				0.15 Zr
	70 Mo-30W	0.15						69.80	30.00						

Technical Information

Conversion Table Reference - Hardness Scales

Brinell, 10mm Ball, Load 3000kg, Standard Ball	Vickers	Rockwell		Shore
		B Scale, Load 100kg, Diameter 1/16 in. Steel Ball	C Scale, Load 150kg, 120° Diamond Cone	
HB	**HV**	**HRB**	**HRC**	**HS**
-	940	-	68.0	97
-	920	-	67.5	96
-	900	-	67.0	95
(767)	880	-	66.4	93
(757)	860	-	65.9	92
(745)	840	-	65.3	91
(733)	820	-	64.7	90
(722)	800	-	64.0	88
(712)	-	-	-	-
(710)	780	-	63.3	87
(698)	760	-	62.5	86
(684)	740	-	61.8	-
(682)	737	-	61.7	84
(670)	720	-	61.0	83
(656)	700	-	60.1	-
(653)	697	-	60.0	81
(647)	690	-	59.7	-
(638)	680	-	59.2	80
(630)	670	-	58.8	-
(627)	667	-	58.7	79
-	677	-	59.1	-
(601)	640	-	57.3	77
-	640	-	57.3	-
(578)	615	-	56.0	75
-	607	-	55.6	-
(555)	591	-	54.7	73
-	579	-	54.0	-
(534)	569	-	53.5	71
-	553	-	52.5	-
(514)	547	-	52.1	70
495	539	-	51.6	-
-	530	-	51.1	-
-	528	-	51.0	68
477	516	-	50.3	-
-	508	-	49.6	-
-	508	-	49.6	66
461	495	-	48.8	-
-	491	-	48.5	-
-	491	-	48.5	65
444	474	-	47.2	-
-	472	-	47.1	-
-	472	-	47.1	63

Brinell, 10mm Ball, Load 3000kg, Standard Ball	Vickers	Rockwell		Shore
		B Scale, Load 100kg, Diameter 1/16 in. Steel Ball	C Scale, Load 150kg, 120° Diamond Cone	
HB	**HV**	**HRB**	**HRC**	**HS**
429	455	-	45.7	61
415	440	-	44.5	59
401	425	-	43.1	58
388	410	-	41.8	56
375	396	-	40.4	54
363	383	-	39.1	52
352	372	110.0	37.9	51
341	360	109.0	36.6	50
331	350	108.5	35.5	48
321	339	108.0	34.3	47
311	328	107.5	33.1	46
302	319	107.0	32.1	45
293	309	106.0	30.9	43
285	301	105.5	29.9	-
277	292	104.5	28.8	41
269	284	104.0	27.6	40
262	276	103.0	26.6	39
255	269	102.0	25.4	38
248	261	101.0	24.2	37
241	253	100.0	22.8	36
235	247	99.0	21.7	35
229	241	98.2	20.5	34
223	234	97.3	18.8	-
217	228	96.4	17.5	33
212	222	95.5	16.0	-
207	218	94.6	15.2	32
201	212	93.8	13.8	31
197	207	92.8	12.7	30
192	202	91.9	11.5	29
187	196	90.7	10.0	-
183	192	90.0	9.0	28
179	188	89.0	8.0	27
174	182	87.8	6.4	-
170	178	86.8	5.4	26
167	175	86.0	4.4	-
163	171	85.0	3.3	25
156	163	82.9	0.9	-
149	156	80.8	-	23
143	150	78.7	-	22
137	143	76.4	-	21
131	137	74.0	-	-
126	132	72.0	-	20
121	127	69.8	-	19
116	122	67.6	-	18
111	117	65.7	-	15

Note: Figures in parentheses under Brinell indicate values using tungsten carbide ball.

SAFETY PAMPHLET

1. In using tungsten carbide tools.

As product liability (PL Law) has been enforced on 1st July 1995, Dijet Industrial Co., Ltd. (hereafter Dijet) started to append a warning or caution label on the package materials for pertinent products.

However, on the tool bodies, no warning or caution label is attached, and therefore, you should read this safety pamphlet before you use any kind of Dijet products or other tools made of our high hard materials.

You are also requested to make well known the contents of this pamphlet to every worker in your plant as a part of your plant safety education program.

2. Basic features of high hard tools materials.

The high hard tools material is a general term for the sintered material of tungsten carbide alloy, the chief ingredient of which is tungsten carbide (WC), cermet whose chief ingredients are titanium nitride, carbide, cubic boron nitride (CBN) and/or sintered diamond. These materials are sometimes called just “hard metal”.

2-1. Physical properties of hard metal.

Appearance	: It differs according to the materials/ Exam: gray, dark gray, black, gold, etc.
Smell	: Odorless
Hardness	: Carbide & Cermet - HV500 Ceramics - HV1.000 CBN - HV2,500 Sintered diamond - HV8,000
Density	: Carbide - 9 - 15 Cermet - 6 - 9 Ceramics & CBN - 3 - 5

2-2. Ingredients

Carbide, Nitride, Carbo-nitride and Oxide of W, Ti, Al, Ta or B and in addition, in some of them, metal ingredients like Co, Ni, Cr or Mo etc. are contained.

3. Precautions for handling hard metal tool materials.

- Hard metals have the feature of high hardness but are also brittle.
  Therefore, they will crack by strong impact or clamping too fast.
- Hard metals are very heavy. In case of large sized tools or big quantities, they need to be handled as weight cargo.
- The heat expansion rate of hard metal is different from that of steel materials.
  Therefore, shrink fitted or force fitted tools can break if they are in extremely high (or low) temperature than the designed value.

4. Precautions for processing of hard metal.

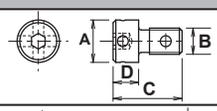
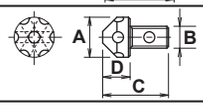
- When cooled by grinding solution or water the strength of the material can deteriorate.
  Special attention should be made for storage condition of these materials.
  According to the surface condition, the strength of materials will be greatly lowered.
  Use a diamond wheel for finishing of surface roughness.
- Dust will be generated in grinding operation.
  Chronic inhalation may cause “hard metal lung: and is dangerous to your health.
  Provide exhaust ventilation and wear appropriate protective equipment like dust mask, etc.
  When skin contact or eye contact occurs, wash thoroughly with water.
- In grinding of hard metals or brazed tools, heavy metal ingredient will remain in the waste fluid.
  Waste fluid must be completely disposed of in a safe way.
- After re-grinding of brazed tools, confirm that cracks on the surface of tools are completely eliminated.
- In marking on hard metal materials of finished goods with laser or electric pens, minute cracks bay be generated on the surfaces.
- Avoid marking on the position where stress will be imposed.
  In electric discharging process on hard metal, residue cracks will remain on the surfaces causing lowering of strength. These cracks must be completely ground off.

Instructions For Using Cutting Tools

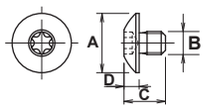
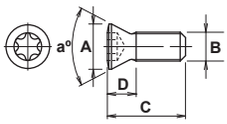
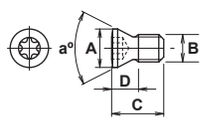
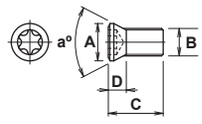
ITEM	HAZARD	COUNTERMEASURE
General Cutting Tools	Direct contact to the sharp cutting edge may cause injury.	Wear protective gloves when taking out of box or mounting to the machine.
	Misuse or mismatch of working conditions may cause tool breakage or dispersion of broker pieces.	Provide safety covers, wear safety glasses and/or protective gloves. Read instruction manual before using. Refer to the recommended conditions in catalog.
	Excess impact or heavy wear will increase cutting resistance and may cause tool breakage and dispersion of broken pieces.	Change tools a little early. Provide safety covers, wear safety glasses and protective gloves.
	Dispersion of heated or prolonged chips may cause injury or burn.	Provide safety covers, wear safety glasses and/or protective gloves. Get rid of chips safely.
	During cutting operation, cutting tools get very hot. Direct contact to tools immediately after operation may cause burn.	Wear protective equipment like protective gloves.
	Sparks, generation of heat or chips in high temperature during operation may cause fire.	Avoid operation when ignition or explosion is expected. When insoluble coolant is used, enough fire fighting measure must be taken.
	Lack of dynamic balance in high speed rotation may cause runout and the tool may break by vibration.	Provide test run and confirm if vibration or chattering is observed.
	Direct contact to the burrs on the work part may cause injury.	Do not contact with bare hand. Wear protective gloves.
Indexable Cutting Tools	When inserts or parts are not clamped properly, falling off or dispersion may occur and cause injury.	Clean up the insert pocket or fastening parts before reloading. Confirm if the inserts or parts are correctly clamped by the supplied wrench.
	When clamped too tight by supplementary tools like pipe etc., inserts or body may be broken and unusable.	Be sure to use supplied wrench.
	When indexable tools are used in high-speed rotation, insert or parts may burst out of the body due to antifugal force.	Use within the recommended cutting conditions. Refer to the instruction manual on catalogs.
Milling Cutters and Other Rotating Tools	Since milling cutters have sharp edges, direct contact with bare hands may cause injury.	Wear protective gloves.
	If cutter lacks dynamic balance or rotates eccentrically, tool breakage or dispersion of broken pieces may occur by runout or vibration.	Use the cutter within the range of recommended working conditions. Rotating portion and dynamic balancing should be periodically checked to prevent eccentric rotation or run out due to wear of bearing portion.
Drill	When drilling through hole on work piece, a disc of work material may fly out end of hole. It is very dangerous since the disc has sharp edges.	Provide safety covers, wear safety glasses and/or protective gloves. Also provide protective covers around drill holding. portion.
	Micro drills have sharp points, direct contact with fingers is dangerous. If broken, small pieces may remain in the wound and disperse around the body.	Handle carefully with protective gloves and protective glasses.
Brazed Tools	Dispersion of broken tips by tool breakage or falling of tool may cause injury.	Confirm if tips are firmly brazed. Avoid using in this condition, which requires generation of high cutting temperature.
Others	When brazing is carried out time and again, the strength of carbide tip is deteriorated and becomes easily broken during operation.	Carbide tip which is brazed several times should not be used, its strength has deteriorated.
	It is dangerous to use tools other than the fixed application. It may cause damage of tool and machine.	Use the tool as prescribed in the instruction manual.

Parts

Adjustable Screws

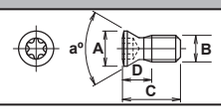
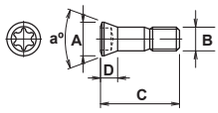
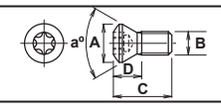
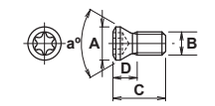
DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench
		A	B	C	D	E	a°	
	ASW-113	4.8	No. 10-32UNF	12.7	4.8	-	-	AD-1845
	ADS-513	7.8	M5 x 0.5	13.0	5.0	-	-	AD-2080
	ADS-514	5.6	M5 x 0.5	14.5	6.5	-	-	AD-2080
	ASW-513	9.0	M5 x 0.5	13.0	5.0	-	-	AD-1845

Clamp Screws

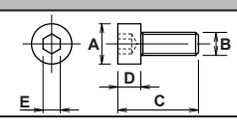
DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque Nm	Torque lbs./ft
		A	B	C	D	E	a°			
	CB3540	9.0	M3.5 x 0.6	6.3	2.3	-	-	T-15	2.1	1.55
	CSW-1838	2.7	M1.8 x 0.35	3.7	1.8	-	55	T-6	0.25	.18
	CSW-206	3.5	M2.5 x 0.45	5.0	2.4	-	55	T-8	0.9	.66
	CSW-2542	3.0	M2.5 x 0.45	4.2	2.5	-	43	T-7	0.9	.66
	CSW-2547	3.4	M2.5 x 0.45	4.7	2.5	-	43	T-7	0.9	.66
	CSW-3570	5.5	M3.5 x 0.6	7.0	3.5	-	55	T-15	2.1	1.55
	CSW-3595	5.5	M3.5 x 0.6	9.5	3.5	-	55	T-15	2.1	1.55
	CSW-406H	5.0	M4 x 0.7	6.0	3.6	-	43	T-15	3.6	2.66
	CSW-407	5.0	M4 x 0.7	7.0	3.6	-	43	T-15	3.6	2.66
	CSW-408H	5.0	M4 x 0.7	8.0	3.6	-	43	T-15	3.6	2.66
	CSW-4510	6.6	M4.5 x 0.75	10.0	4.0	-	57	T-20	5.0	3.69
	CSW-510	6.4	M5 x 0.8	11.0	4.5	-	43	T-20	5.5	4.06
	DSW-1838H	2.5	M1.8 x 0.35	3.8	2.0	-	55	T-6	0.4	-
	DSW-306H	4.3	M3 x 0.5	6.5	3.2	-	55	T-10	1.8	1.33
	DSW-307	4.3	M3 x 0.5	7.5	2.8	-	55	T-10	1.4	1.03
	DSW-307H	4.3	M3 x 0.5	7.6	3.2	-	55	T-10	1.8	1.33
	DSW-4075	5.2	M4 x 0.7	7.5	3.5	-	55	T-15	3.6	2.66
	DSW-408	6.0	M4 x 0.7	8.5	3.6	-	55	T-15	3.6	2.66
	DSW-4085	5.3	M4 x 0.7	8.6	3.5	-	55	T-15	3.6	2.66
	DSW-410H	5.3	M4 x 0.7	10.0	3.7	-	55	T-15	3.6	-
	DSW-4510H	6.8	M4.5 x 0.75	10.0	4.7	-	55	T-20	6.0	4.43
	DSW-4512H	6.8	M4.5 x 0.75	12.5	5.2	-	55	T-20	6.0	4.43
	DSW-4515H	6.8	M4.5 x 0.75	15.5	5.2	-	55	T-20	6.0	-
	DSW-509	7.0	M5 x 0.8	9.5	4.9	-	55	T-20	6.1	4.50
	DSW-511H	7.0	M5 x 0.8	11.5	4.9	-	55	T-20	6.1	4.50
	DSW-512V	7.2	M5 x 0.8	12.5	6.0	-	55	T-25	6.1	4.50
	ESW-205	3.6	M2.5 x 0.45	5.5	2.0	-	60	T-8	0.9	.66
	ESW-206	3.6	M2.5 x 0.45	6.0	2.0	-	60	T-8	0.9	.66
	ESW-304	4.0	M3 x 0.5	4.5	2.0	-	55	T-8	1.4	1.03
	ESW-306	4.0	M3 x 0.5	6.0	2.0	-	55	T-8	1.4	1.03
	ESW-307	4.0	M3 x 0.5	7.5	2.0	-	55	T-8	1.4	1.03
	ESW-405	5.3	M4 x 0.7	5.9	2.7	-	55	T-15	3.1	2.29
	ESW-406	5.3	M4 x 0.7	6.6	2.7	-	55	T-15	3.1	2.29
	ESW-408	5.3	M4 x 0.7	8.0	2.7	-	55	T-15	3.1	2.29
	ESW-410	5.3	M4 x 0.7	10.0	2.7	-	55	T-15	3.1	2.29
	ESW-412	5.3	M4 x 0.7	12.0	2.7	-	55	T-15	3.1	2.29
	ESW-507	6.8	M5 x 0.8	7.5	3.4	-	55	T-25	5.5	4.06
	ESW-508	6.8	M5 x 0.8	8.2	3.4	-	55	T-25	5.5	4.06
	ESW-510	6.8	M5 x 0.8	10.0	3.4	-	55	T-25	5.5	4.06

Parts

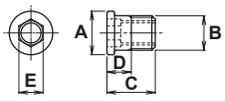
Clamp Screws

DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque Nm	Torque lbs./ft
		A	B	C	D	E	a°			
	FS1030	6.6	M5 x 0.8	10.9	5.5	-	60	T-20	5.5	4.06
	FS1030S	6.6	M5 x 0.8	9.5	5.5	-	60	T-20	5.5	4.06
	FSW-2005H	2.5	M2 x 0.25	5.0	1.3	-	40	T-06	0.5	.37
	FSW-2506H	3.0	M2.5 x 0.35	6.6	1.5	-	40	T-07	0.9	.66
	FSW-3007H	3.8	M3 x 0.35	8.1	2.0	-	40	T-08	1.2	.89
	FSW-3509	4.7	M3.5 x 0.6	9.6	2.3	-	40	T-10	2.0	1.48
	FSW-4013	5.8	M4 x 0.7	13.5	3.3	-	40	T-15	3.0	2.21
	FSW-5016	6.8	M5 x 0.8	16.4	3.2	-	40	T-20	4.0	2.95
	FSW-6020	8.5	M6 x 1.0	20.0	4.3	-	40	T-30	5.0	3.69
	FSW-8025	11.0	M8 x 1.25	25.0	5.5	-	40	T-40	6.0	4.43
	HSW-614H	10.0	M6 x 1.0	15.0	7.3	-	60	T-30	7.5	5.53
	TSW-2250	3.1	M2.2 x 0.45	5.0	2.3	-	60	T-07	0.6	.44
	TSW-2556H	3.6	M2.5 x 0.45	5.6	2.7	-	60	T-08	0.9	.66
	TSW-3512H	5.3	M3.5 x 0.6	11.5	4.5	-	60	T-15	2.1	-
	TSW-408	5.5	M4 x 0.7	8.0	3.3	-	60	T-15	3.1	2.29
	TSW-511	7.0	M5 x 0.8	11.0	5.0	-	60	T-20	5.5	4.06
	TSW-612	8.5	M6 x 1.0	12.0	4.8	-	60	T-25	7.5	5.53

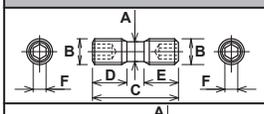
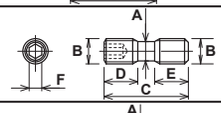
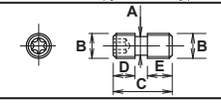
Hexagon Socket Head Cap Screws

DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque
		A	B	C	D	E	F		
	HCS4-10	7.0	M4 x 0.7	14.0	4.0	3.0	-	-	-
	HCS5-10	8.5	M5 x 0.8	15.0	5.0	4.0	-	-	-

Shim Screws

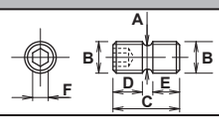
DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque Nm	Torque lbs./ft
		A	B	C	D	E	a°			
	SSW-535	6.3	M5 x 0.5	7.0	3.1	3.5	-	-	6.5	-
	SSW-745	8.4	M7 x 0.5	8.0	2.9	4.5	-	-	8.0	-

Wedge Screws

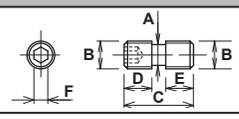
DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque Nm	Torque lbs./ft
		A	B	C	D	E	F			
	LS-1	4.6	M6 x 1.0	22.0	8.5	8.5	3.0	-	6.0	4.43
	LS-101	4.6	M6 x 1.0	16.0	6.5	6.5	3.0	-	6.0	4.43
	LS-106	4.6	M6 x 1.0	14.5	6.5	5.0	3.0	-	6.0	4.43
	LS-107	4.6	M6 x 1.0	13.0	5.0	5.0	3.0	-	6.0	4.43
	LS-109	5.5	M7 x 0.75	19.0	7.5	8.0	-	T-25	7.0	5.16
	LS-110	4.8	M6 x 0.75	22.0	8.0	8.0	-	T-15	6.0	-
	LS-180	6.0	M8 x 1.0	19.0	7.0	8.0	-	T-27	8.0	5.90

Parts

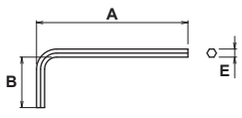
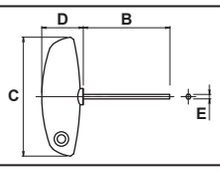
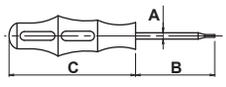
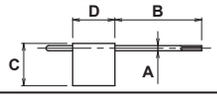
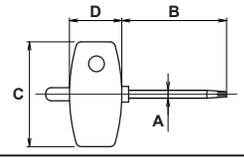
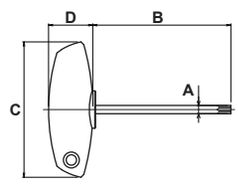
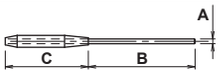
Rest Button Screws

DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque
		A	B	C	D	E	F		
	LS-113	3.7	No. 10-32UNF	10.2	4.5	4.1	2.4	-	-

Clamp Screws

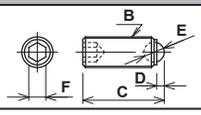
DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque Nm	Torque lbs./ft
		A	B	C	D	E	F			
	SLS-3	6.0	M8 x 1.0	20.0	8.0	8.0	4.0	-	8.0	5.90

Wrenches

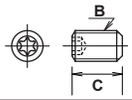
DRAWING	CATALOG NUMBER	DIMENSIONS					Wrench Size
		A	B	C	D	E	
	LW-025	59.5	18.0	-	-	2.5	-
	LW-030	67.0	20.0	-	-	3.0	-
	LW-035	71.5	22.5	-	-	3.5	-
	LW-040	75.0	25.0	-	-	4.0	-
	LW-045	80.5	27	-	-	4.5	-
	LW-050	80.0	28.0	-	-	5.0	-
	A-030	-	60.0	80.0	28.0	3.0	-
	A-07SD	4.0	60.0	80.0	-	-	T-7
	A-08SD	4.0	70.0	80.0	-	-	T-8
	A-10SD	4.0	70.0	95.0	-	-	T-10
	A-20SD	5.0	90.0	105.0	-	-	T-20
	A-25SD	5.0	100.0	105.0	-	-	T-25
	A-06	1.7	34.5	15.0	15.0	-	T-6
	A-07	2.0	34.5	15.0	15.9	-	T-7
	A-08	2.3	39.0	19.0	19.0	-	T-8
	A-10	3.0	40.0	40.0	20.0	-	T-10
	A-15	3.5	45.0	40.0	20.0	-	T-15
	A-20W	4.0	45.0	40.0	20.0	-	T-20
	A-15T	4.0	100.0	80.0	26.0	-	T-15
	A-20	4.0	100.0	100.0	32.0	-	T-20
	A-20L	5.5	200.0	100.0	32.0	-	T-20
	A-25	4.5	100.0	100.0	32.0	-	T-25
	A-27	5.5	100.0	100.0	32.0	-	T-27
	A-30	6.0	100.0	100.0	32.0	-	T-30
	A-40	7.0	100.0	100.0	32.0	-	T-40
	AD-1845	1.8	45.0	-	-	-	-
	AD-2080	2.0	45.0	35.0	-	-	-

Parts

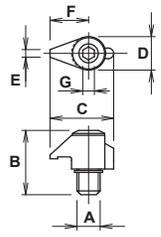
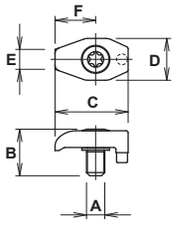
Adjustable Screw

DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque
		A	B	C	D	E	F		
	LSM-512	-	M5 x 1.0	12.6	1.0	3.0	2.5	-	-

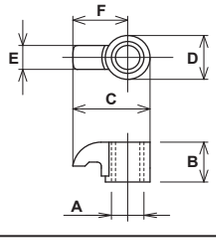
Hexagon Socket Set Screw

DRAWING	CATALOG NUMBER	DIMENSIONS						Wrench	Torque
		A	B	C	D	E	F		
	RSW-05008	-	M5 x 0.8	8.0	-	-	-	T-10	-

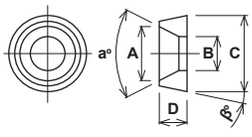
Clamp Sets

DRAWING	CATALOG NUMBER	DIMENSIONS							Wrench
		A	B	C	D	E	F	G	
	DCM-1	M5 x 0.8	13.8	13.8	6.8	2.0	8.5	2.5	-
	DCM-5	M6 x 1.0	17.0	16.5	8.9	2.0	10.0	3.0	-
	DCM-17	M4.5 x 0.75	11.7	18.0	10.5	5.0	10.0	-	T-20
	DCM-18	M3.5 x 0.6	10.0	13.0	7.6	3.0	7.2	-	T-15

Clamp

DRAWING	CATALOG NUMBER	DIMENSIONS					
		A	B	C	D	E	F
	DCM-2	M8 x 1.0	10.0	19.0	11.0	6.0	13.5

Clamp Washer

DRAWING	CATALOG NUMBER	DIMENSIONS					
		A	B	C	D	a°	β°
	CW-11	8.0	5.0	11.0	4.0	55	12

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Notes

Corporate History

1938 Started cemented carbide tool production as domestic division of Kobayashi Industrial Co., Ltd.

1950 Reorganized as Hyakunen Industrial Co., Ltd.

1954 Teitaro Ikezumi appointed President.
Company renamed DIJET Industrial Co., Ltd.

1971 New alloy factory completed.
Developed cermet **SUZ**, the world's first titanium carbide alloy.
Began marketing **DIJET-Future Mills**, currently marketed as DIJET Mills.

1972 Developed NIT, the world's first nitride carbide alloy.

1973 Completed new DPC Process utilizing a **HOT Isostatic Press**.
Awarded **best JIS performance factory** by the Ministry of International Trade and Industry.

1974 Exported carbide alloy production technology for Cermet alloys to the United States.

1975 Kaiser-Dijet carbide factory complete in Michigan, U.S.A. and Dijet carbides introduced to US Market.

1976 Developed the world's first cemented carbide ball nose end mill, marketed as **DIJET-Hosoi Mills**.

1977 Awarded a prize by the machinery Technology Promotion Association.

1978 Developed and innovative cemented carbide twist drill marketed as **DIJET-Hosoi Drills**.

1979 Developed polycrystalline sintered CNB (Cubic Boron Nitride), marketed as **JBN**.

1980 Technological and sales collaborative agreement signed with **KENNAMETAL**.
New Research Laboratory completed.
New Coating Plant completed.

1981 Developed **NAT**, a TiN+TiC compound cerment.
Developed polycrystalline sintered diamond, marketed as **JDA**.

1983 **Dijet, Inc.** established as a U.S. subsidiary.
Multipurpose TH chip breakers developed.
End-chippers, multipurpose tool developed for production line automation.
Developed roughing end mills, and indexable high speed, fast feed mill.

1985 Completed Tondabayashi Factory.
Nagoya factory was formed and strengthened.
Listed on the Tokyo Second Market.
Established DIJET Industrial Co. (Europe) in England.

DIJET INDUSTRIAL CO., LTD. (ENGLAND)

1986 Dijet End-Chipper selected by **the Science and Technology Agency** as an invention of special merit.

1987 Established Europe Stock Center in West Germany.

1988 Developed fiber-reinforced ceramics **CA200** having a physical property of crack growth resistance.
Acquired **INDEX-O-MATIC Inc.**, a manufacturing firm of metal cutting tools in Michigan U.S.A. for DIJET manufacturing base in the United States.

1989 Listed as a member of 1st Section of Tokyo, Oaska, and Nagoya Stock Exchange.

1990 Large-scale CIP device is set up and operational.
Developed and put on the market tough cermet **CX90**.
Put on the market all-purpose **UA** chip breaker and **F1** chip breaker for finishing application.
Multi-functioned indexable end mill, **C-chipper** was awarded the 1990 Prize of the Cemented Carbide Manufacturers Association (CCMA).

DIJET INC (USA)

Corporate History

1991 **Dijet, Inc. and Index-O-Matic, Inc. merged to become Dijet, to enhance management efficiency by integrating manufacturing and sales.**
Europe Representation office was reorganized as Europe branch in Great Britain.
Completed Tsukuba Factory.

1992 Completed Mie Factory.
Developed **Sigma Drill** for deep drilling.
Development of ultra high rake cutter **Feather-Mill**.
Dijet, Inc. receives Ford Q1 certification.

1994 Development of the tough drill for metal working, **S-Cut Drill**.

1996 Bankok Representative office opened in Thailand.

1997 Dijet Industrial awarded **ISO9001**.
Korea Representative office opened.

2000 Development of the ultra precision indexable ball nose end mill **Mirror Ball**.
Development of the high performance **Mirror Radius**.

2001 Development of the ultra precision indexable carbide shank ball nose end mill **Mirror Ball C body**.
Development of the tough cutter **Octoblader**.
Development of the multi-purpose end mill **Super End-Chipper**.

2002 Development of the Ultimate Diamond, **Beam Drill** and **End Mill Beam**.
Development of 90º facemill **Mighty Blader**.
Development of new roughing ball nose **Swing Ball**.
European Technical Service opened in Italy.
Shanghai Representative office opened in China.

2003 Development of High-Speed face mill, **SKS**.

2004 Development of the tough drill for metal working **Indexable S-Cut** drill.

2005 Development of the **Final Drill** for dry machining.
Mie factory is expanded.
Completed new factory for making materials.

2006 Nozomi Ikezumi was appointed as Chairman.
Ayumi Ikezumi was appointed as President.
Guangdon Representative office opened in China.
Development of high efficient button cutter the **Super Diemaster**.

2007 Mumbai Representative office opened in India.

2008 Development of the **Finish-One** end mill for finishing on reference surface of bottom face on die shoe and upper holder.
Development of high metal removal face mill, **Hepta Mill**.

2009 Completion of Mie second factory.
Development of the multi-purpose solid carbide end mill **One-Cut Helical** for Aluminum.
Dilian Representative office opened in China.

2010 Development of super cermet **"SC alloy"** with improved chipping & wear resistance.
Wuhan office opened in China.

2011 Development of **Finish Jet Mill** super high efficient finishing on surface bottom face of die & mold.

Oaska Plant (Carbide, CT, Wear Parts)

Mie Plant (Raw Material Powder)

Mie Plant (TA & IT Plant)

Mie Plant (Carbide)

Tondabayashi Plant

WORLDWIDE DISTRIBUTION

Europe:

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Poland
Portugal
Slovenia
Rumania
Spain
Sweden
Switzerland

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Bulgaria
Russia
Ukraine

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Israel
Pakistan
Turkey

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Indonesia
Japan
Korea
Malaysia
Philippines
Singapore
Taiwan
Thailand
Vietnam

North America:

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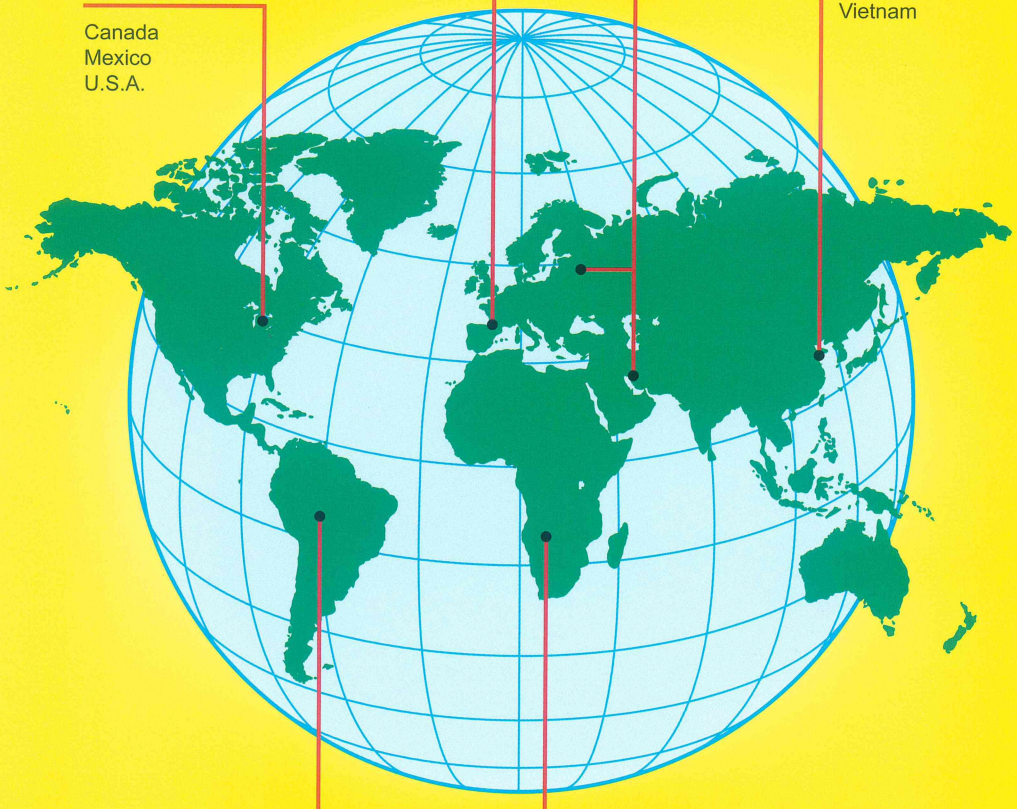
Mexico
U.S.A.



South America:

Brazil

Africa:

South Africa

DIJET INDUSTRIAL CO., LTD.
Unit 2 Mundells Court, Welwyn Garden City
Herts AL7 1EN, England
Phone: +44 (0) 1707-32544 Fax: +44 (0) 1707-330197

DIJET INDUSTRIAL CO., LTD.
2-1-18, Kami-Higashi, Hirano-ku,
Osaka 547-0002, Japan
Phone: +81-6-6794-0167
Fax: +81-6-6793-3930
www.dijet.co.jp

TECHNO TRADE
Spanjestraat 17 6065 BT Montfort NL - Postbus 7 6100 AA Echt NL
E: info@techno-trade.nl T: 0031(0)475 549 000
I: www.techno-trade.nl F: 0031(0)475 549 001

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