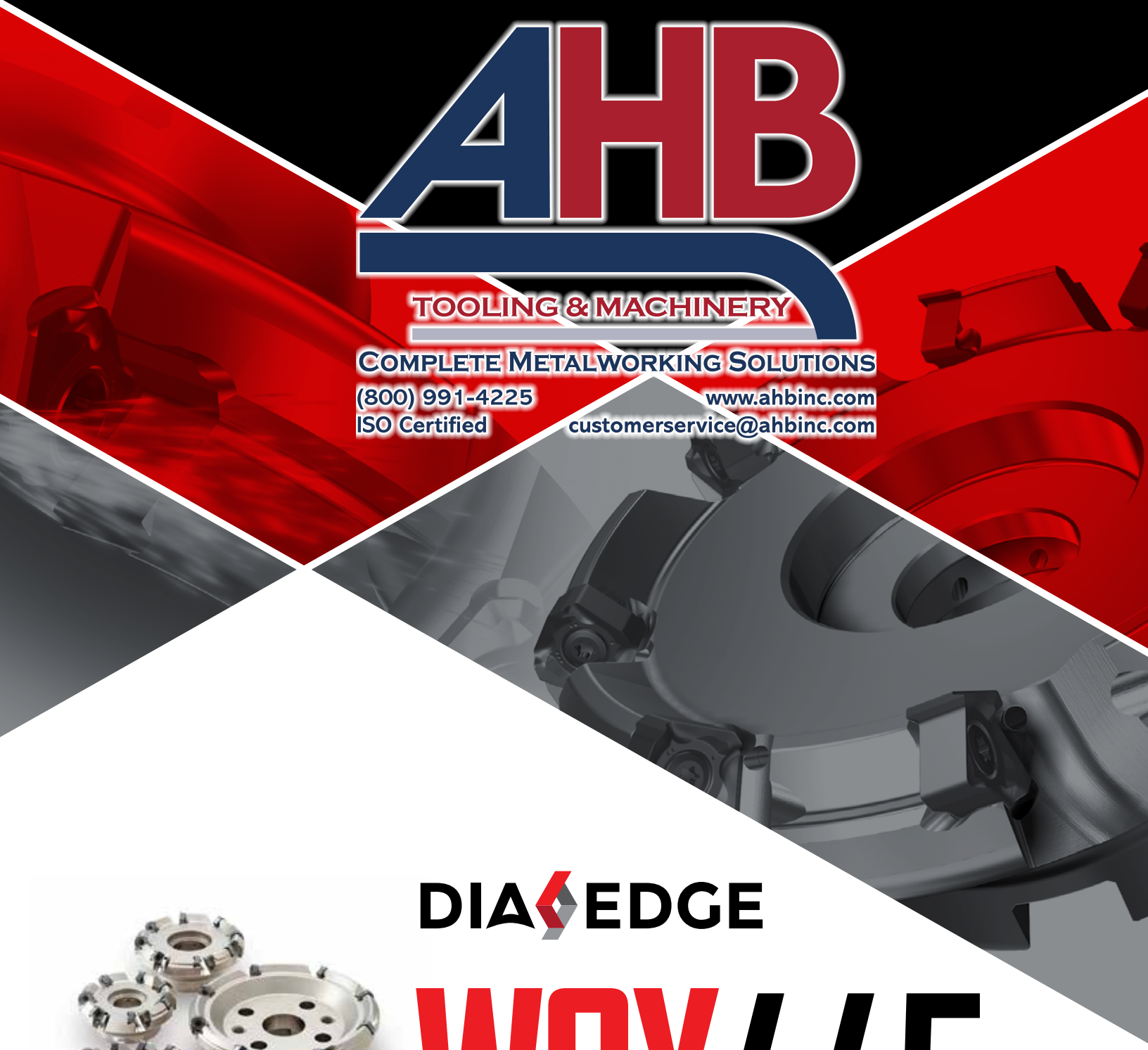


DIA EDGE

WSX445

GENERAL PURPOSE DOUBLE-SIDED INSERT TYPE FACE MILL FEATURES LOW CUTTING RESISTANCE AND UNIQUE DOUBLE Z INSERT GEOMETRY

ABOUT OUR BRAND

Your manufacturing success is our success.

It's simple. We want to provide high-quality cutting tool products that help deliver unparalleled performance and control for you to manufacture precisely perfect products every day.

Our long heritage of building partnerships through cutting tool solutions to metal working manufacturers, like yours, has given Mitsubishi Materials USA a solid reputation as an industry leader. We understand the importance of getting it right the first time by delivering high-quality cutting tool product brands to help overcome machining challenges to improve machining processes.

Your success is our success and is the driving force behind our innovative products. Our product brands, DIAEDGE and MOLDINO, are trusted globally in the metal manufacturing and die & mold industries for delivering expertly-designed manufactured tools of the trade for highly specialized industries like yours.

With the acquisition of MOLDINO Tool Engineering, Ltd, our traditional Mitsubishi Materials USA cutting tool product line is now sold under the DIAEDGE product brand name.

Brands you can trust:

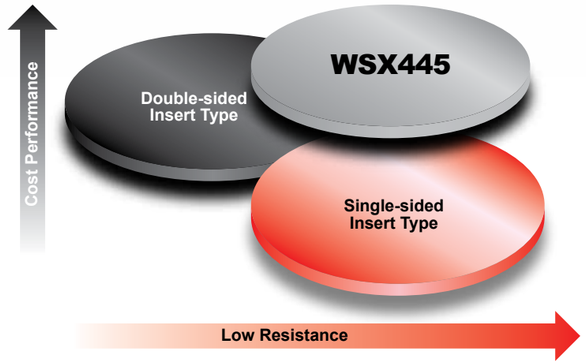
MITSUBISHI MATERIALS U.S.A.

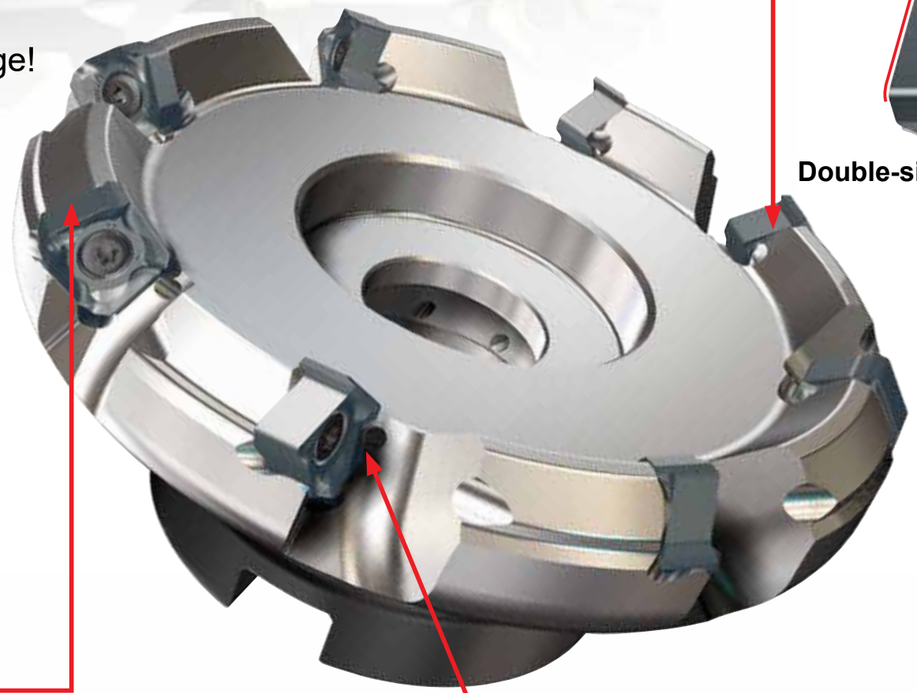
TRUSTED PRODUCT BRANDS

DIAEDGE MOLDINO

WSX445 GENERAL PURPOSE DOUBLE-SIDED INSERT TYPE FACE MILL FEATURES LOW CUTTING RESISTANCE

New double-sided insert type face milling cutter with innovative cutting edge!
Perfect balance between convenience and high efficiency!





Unique Double Z Insert Geometry

Mitsubishi Materials' proprietary "Double-sided, Z Geometry" insert features sharp cutting edges with low cutting resistance by utilizing features of conventional positive and negative rake inserts.

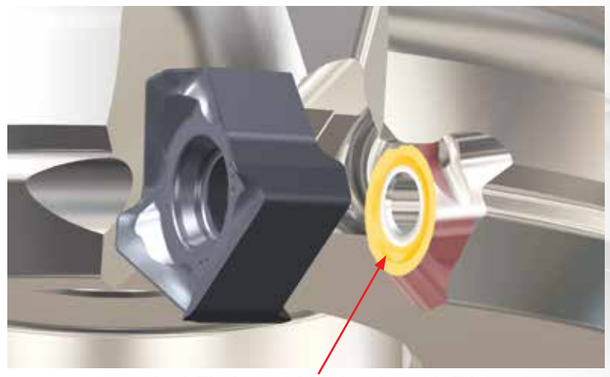
Double-sided, Z Geometry

WSX445

For Sharper Cutting Edge **Double-sided Insert**

Designed to control abnormal insert breakage and body damage

The unique conical insert pocket seating and Anti Fly Insert mechanism (A.F.I.) combine to securely hold the insert. Since the outer edge of the insert is not in contact with the cutter body damage from sudden fracturing is unlikely to cause damage to the cutter body.
Shims are not needed due to the high rigidity of the very thick insert.

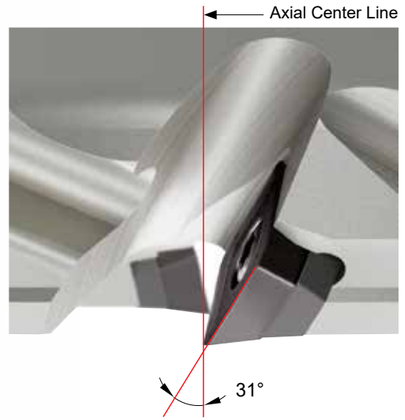


Anti Fly Insert Mechanism (A.F.I.)

Through Coolant Holes

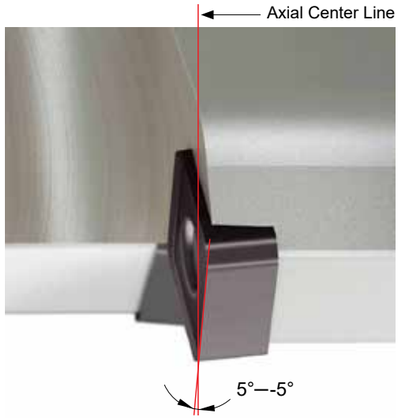
Improves chip discharge and prevents chip welding.

Conventional Positive Insert



For Sharper Cutting Edge **Single-sided Insert**

Conventional Negative Insert

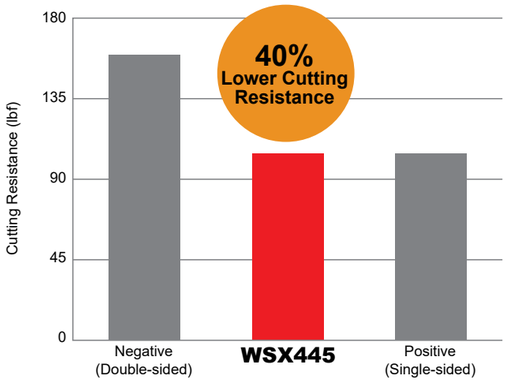


For Higher Edge Strength **Double-sided Insert**

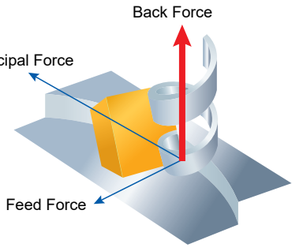
Cutting Resistance

WSX445's low cutting resistance equals that of single-sided insert cutters.
The low axial and radial forces reduce vibrations to a minimum.

[Comparison of the Back Force]



WSX445 M Breaker
Conventional Insert



<Cutting Conditions>
Workpiece Material : AISI 4140
Cutter Dia. : DC=5 inch
Cutting Speed : vc=655 SFM
Feed per Tooth : fz=.008 IPT
Depth of Cut : ap=.157 inch
Width of Cut ae=4 inch
Cutting Mode : Dry Cutting
Single Insert

<Back Force>
Cutting force in the axial direction. Back force can cause inaccuracy and vibration, resulting in deflection of the work material as well as cutting tools.

Chip Discharge Effect

Chips are discharged outwardly because of the negative / positive edge design.
This helps prevent jamming of continuous chips and damage of coolant hole.

Conventional Positive Insert | WSX445 | Conventional Negative Insert A | Conventional Negative Insert B

Chips generated are cylindrical and are discharged away from the cutter.

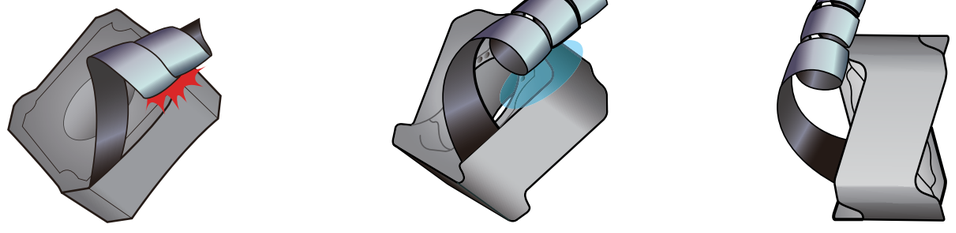
Chips enter the inside of the cutter and cause machining problems.

<Cutting Conditions>
Workpiece Material : AISI 4140
Cutting Speed : vc=490 SFM
Feed per Tooth : fz=.008 IPT
Depth of Cut : ap=.157 inch
Width of Cut ae=4 inch
Cutting Mode : Dry Cutting

Abrasive Damage from Chips

Depth of cut can be set without regard to the unused corner.

Conventional Double-sided Insert | WSX445

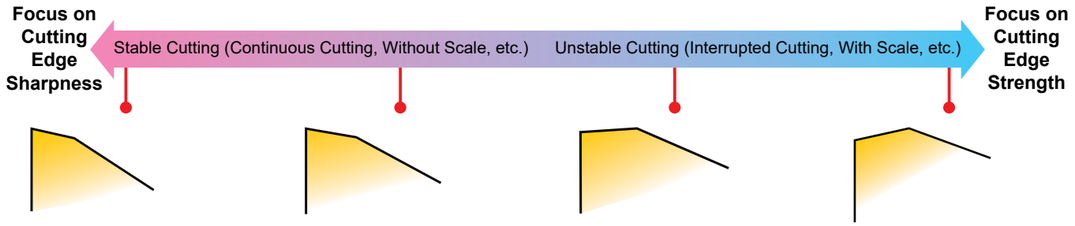


Chips can contact the unused corner.

The chips generated do not contact the unused corner.

Chip Breaker System

Chip breaker series for varied cutting condition.



L Breaker
The high rake angle boosts cutting performance. Positive land retains strength and provides low cutting resistance.

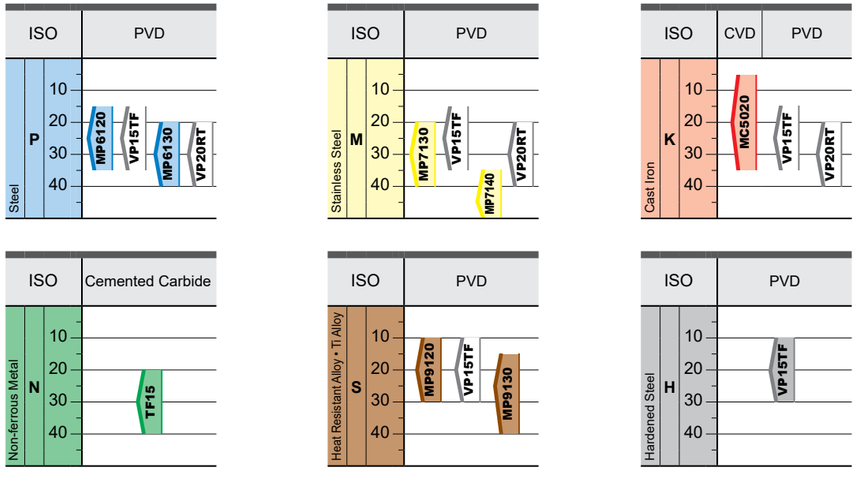
M Breaker
First recommendation for general applications. A good balance of edge strength and sharpness is provided by the optimized positive land and rake angle.

R Breaker
For unstable applications. Enhanced edge strength and retention of sharpness is provided by the negative land and positive rake angle respectively.

H Breaker
For demanding applications. A stronger land and reduced positive rake angle provides maximum edge strength.

Workpiece Material	Cutting Conditions		
	Light	General	Heavy
P	L	M	R, H
M	L	M	
K	L	M	R, H
N		L	
S	L	M	
H	M	R	H

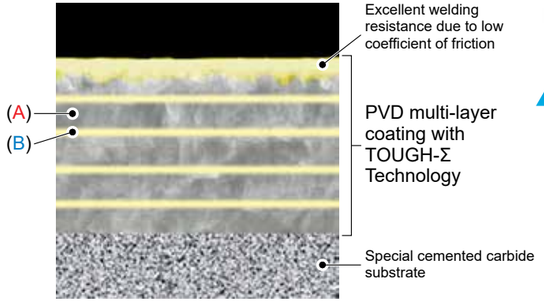
Insert Grades for a Wide Range of Workpiece Materials



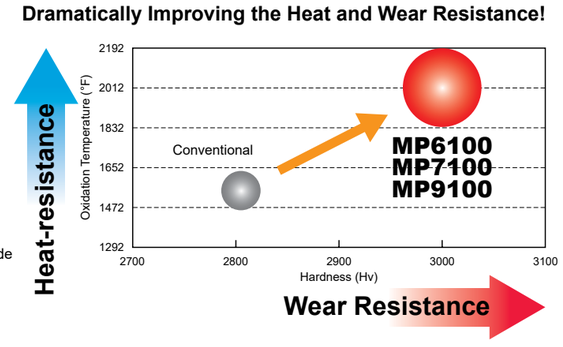
MP6100, MP7100, MP9100 - With Accumulated Al-Ti-Cr-N Based PVD Coating

TOUGH-Σ Technology

A fusion of the separate coating technologies; PVD and multi-layering provides extra toughness.



Dramatically Improving the Heat and Wear Resistance!



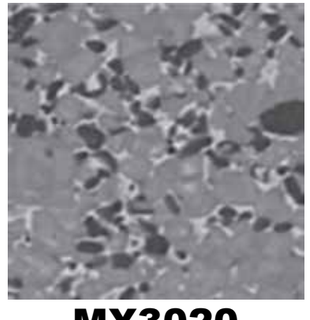
	Workpiece Material	Grade	Coating		Coefficient of Friction		
			Base Layer (A)	Optimized Layer for Work Material (B)	Measured at 1112° F		
					AISI 1055	AISI 304	Ti-6Al-4V
P	Carbon Steels, Alloy Steels	**MP6100**	**High Al-(Al, Ti)N** The new technology Al-(Al, Ti)N provides stability of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.	(Al, Cr) N Based	.4		
				Tough! Resists Chipping			
M	Stainless Steels	**MP7100**		TiN Based		.5	
				Tough! Resists Notching			
S	Titanium Alloys, Heat Resistant Alloys	**MP9100**		CrN Based			.3
				Tough! Resists Thermal Cracking			
				Conventional	.7	.7	.7

Cermet Grade **MX3020/MX3030**

The grade for finishing and light cutting is excellent for welding resistance and is suitable for machining that requires a shiny surface.

MX3020

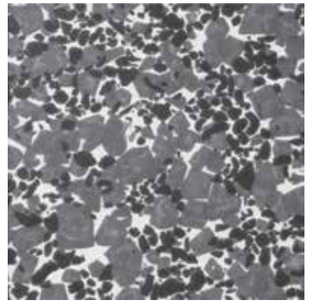
MX3020 is a cermet grade with excellent wear resistance for wiper inserts.



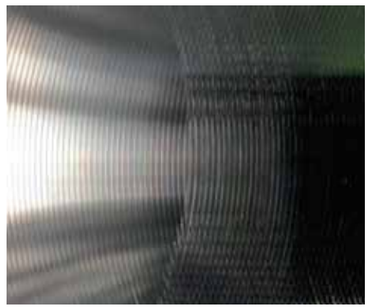
MX3020

MX3030

MX3030 is a cermet grade with excellent fracture resistance and is suitable for finish and light cutting.



MX3030



Conventional

MX3030

<Cutting Conditions>
Workpiece Material : ASTM A36M
Cutter Dia. : DC=5 inch
Cutting Speed : vc=655 SFM
Feed per Tooth : fz=.004 IPT
Depth of Cut : ap=.079 inch
Width of Cut : ae=3.937 inch
Cutting Mode : Dry Cutting
8 Inserts
Center Cut
After 26 feet Cutting Work

FACE MILLING
<GENERAL CUTTING>
WSX445

P M K N S H

- Double-sided Z Geometry.
- Smooth chip discharge.

Fig.1

ø1.5"
ø2"
ø2.5"
ø3"

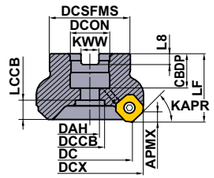
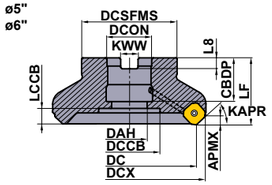


Fig.2

ø4"
ø5"
ø6"



Right hand tool holder only.

■ Arbor Type
Right Hand Tool Holder

KAPR : 45°
GAMP : +17°　　GAMF : -6°–+1°

DC = inch size, DCON = Inch size　　(inch)

DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	Pitch	DCX	LF	DCON	WT(lbs)	APMX	Fig.
1.500	**WSX445UR1503SA**	●	Y	3	Coarse	2.005	1.750	.500	.8	.197	1
1.500	**WSX445UR1504SA**	●	Y	4	Fine	2.005	1.750	.500	.7	.197	1
2.000	**WSX445UR0203AA**	●	Y	3	Coarse	2.506	1.750	.750	1.2	.197	1
2.000	**WSX445UR0204AA**	●	Y	4	Fine	2.506	1.750	.750	1.1	.197	1
2.000	**WSX445UR0205AA**	●	Y	5	Extra Fine	2.506	1.750	.750	1.1	.197	1
2.500	**WSX445UR2504CA**	●	Y	4	Coarse	3.006	2.000	1.000	2.0	.197	1
2.500	**WSX445UR2505CA**	●	Y	5	Fine	3.006	2.000	1.000	2.0	.197	1
2.500	**WSX445UR2506CA**	●	Y	6	Extra Fine	3.006	2.000	1.000	1.9	.197	1
3.000	**WSX445UR0304CA**	●	Y	4	Coarse	3.506	2.000	1.000	2.6	.197	1
3.000	**WSX445UR0306CA**	●	Y	6	Fine	3.506	2.000	1.000	2.5	.197	1
3.000	**WSX445UR0308CA**	●	Y	8	Extra Fine	3.506	2.000	1.000	2.4	.197	1
4.000	**WSX445UR0405EA**	●	Y	5	Coarse	4.506	2.500	1.500	5.9	.197	2
4.000	**WSX445UR0407EA**	●	Y	7	Fine	4.506	2.500	1.500	5.8	.197	2
4.000	**WSX445UR0410EA**	●	Y	10	Extra Fine	4.506	2.500	1.500	5.6	.197	2
5.000	**WSX445UR0506EA**	●	Y	6	Coarse	5.506	2.500	1.500	8.5	.197	2
5.000	**WSX445UR0508EA**	●	Y	8	Fine	5.506	2.500	1.500	8.3	.197	2
5.000	**WSX445UR0512EA**	●	Y	12	Extra Fine	5.506	2.500	1.500	8.0	.197	2
6.000	**WSX445UR0607EA**	●	Y	7	Coarse	6.506	2.500	1.500	10.6	.197	2
6.000	**WSX445UR0610EA**	●	Y	10	Fine	6.506	2.500	1.500	10.4	.197	2
6.000	**WSX445UR0616EA**	●	Y	16	Extra Fine	6.506	2.500	1.500	9.9	.197	2
8.000	**WSX445UR0808MN**	●	N	8	Coarse	8.506	2.500	2.500	19.1	.197	3
8.000	**WSX445UR0812MN**	●	N	12	Fine	8.506	2.500	2.500	18.8	.197	3
8.000	**WSX445UR0820MN**	●	N	20	Extra Fine	8.506	2.500	2.500	18.3	.197	3
NEW 10.000	**WSX445UR1010MN**	●	N	10	Coarse	10.493	2.500	2.500	28.5	.197	3
NEW 10.000	**WSX445UR1014MN**	●	N	14	Fine	10.493	2.500	2.500	29.2	.197	3
NEW 12.000	**WSX445UR1214MN**	●	N	14	Coarse	12.493	2.500	2.500	48.1	.197	4

*1 Y=Yes, N=No
*2 Number of Teeth
(Note1) The cutter body includes a set bolt for an arbor.

● : **USA Stock**

Fig.3

ø8"
ø10"

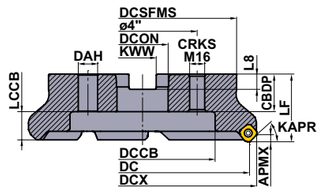
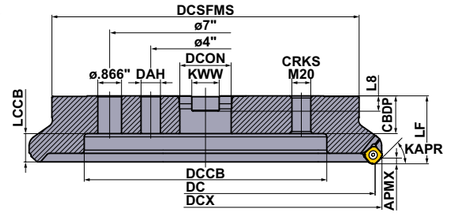


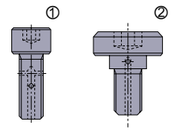
Fig.4

ø12"



Right hand tool holder only.

DC	Set Bolt	Geometry
1.500	HSCU25011H	①
2.000	HSCU37513H	
2.500	HSCU50014H	
3.000	HSCU50014H	
4.000	MBAU75016H	②
5.000	MBAU75016H	
6.000	MBAU75016H	
8.000	—	—
10.000	—	
12.000	—	



Arbor Type Mounting Dimensions

(inch)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
.500	1.500	**WSX445UR1503SA**	.630	.276	.433	.581	1.437	.250	.156	1
.500	1.500	**WSX445UR1504SA**	.630	.276	.433	.581	1.437	.250	.156	1
.750	2.000	**WSX445UR0203AA**	.748	.413	.630	.620	1.750	.313	.187	1
.750	2.000	**WSX445UR0204AA**	.748	.413	.630	.620	1.750	.313	.187	1
.750	2.000	**WSX445UR0205AA**	.748	.413	.630	.620	1.750	.313	.187	1
1.000	2.500	**WSX445UR2504CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	2.500	**WSX445UR2505CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	2.500	**WSX445UR2506CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	3.000	**WSX445UR0304CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	3.000	**WSX445UR0306CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	3.000	**WSX445UR0308CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.500	4.000	**WSX445UR0405EA**	1.417	1.181	2.205	.778	3.500	.625	.375	2
1.500	4.000	**WSX445UR0407EA**	1.417	1.181	2.205	.778	3.500	.625	.375	2
1.500	4.000	**WSX445UR0410EA**	1.417	1.181	2.205	.778	3.500	.625	.375	2
1.500	5.000	**WSX445UR0506EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	5.000	**WSX445UR0508EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	5.000	**WSX445UR0512EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	6.000	**WSX445UR0607EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	6.000	**WSX445UR0610EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	6.000	**WSX445UR0616EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
2.500	8.000	**WSX445UR0808MN**	1.378	.709	5.512	1.053	6.890	1.000	.560	3
2.500	8.000	**WSX445UR0812MN**	1.378	.709	5.512	1.053	6.890	1.000	.560	3
2.500	8.000	**WSX445UR0820MN**	1.378	.709	5.512	1.053	6.890	1.000	.560	3
2.500	10.000	**WSX445UR1010MN**	1.378	.709	7.087	1.053	8.661	1.000	.560	3
2.500	10.000	**WSX445UR1014MN**	1.378	.709	7.087	1.053	8.661	1.000	.560	3
2.500	12.000	**WSX445UR1214MN**	1.575	.709	8.858	.856	11.220	1.000	.560	4

General Purpose Double-sided Insert Type Face Mill Features Low Cutting Resistance

Metric Standard

For inch arbors

Fig.1
ø80

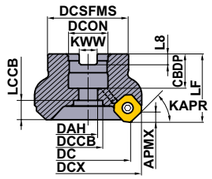
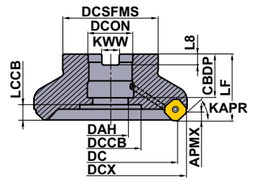


Fig.2
ø100
ø125
ø160



Right hand tool holder shown.

■Arbor Type
Right Hand Tool Holder

GAMP:+17°
GAMF:-6°—+1°

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	✶1 Coolant Thru	✶2 No.T	Pitch	DCX	LF	DCON		WT(kg)	APMX	Fig.
80	**WSX445R08004CA**	★	Y	4	Coarse	92.9	50	25.4	[1.00"]	1.3	5	1
80	**WSX445R08006CA**	★	Y	6	Fine	92.9	50	25.4	[1.00"]	1.2	5	1
80	**WSX445R08008CA**	★	Y	8	Extra Fine	92.9	50	25.4	[1.00"]	1.1	5	1
100	**WSX445R10005DA**	★	Y	5	Coarse	112.9	50	31.75	[1.25"]	1.8	5	2
100	**WSX445R10007DA**	★	Y	7	Fine	112.9	50	31.75	[1.25"]	1.7	5	2
100	**WSX445R10010DA**	★	Y	10	Extra Fine	112.9	50	31.75	[1.25"]	1.6	5	2
125	**WSX445R12506EA**	★	Y	6	Coarse	137.9	63	38.1	[1.50"]	3.2	5	2
125	**WSX445R12508EA**	★	Y	8	Fine	137.9	63	38.1	[1.50"]	3.1	5	2
125	**WSX445R12512EA**	★	Y	12	Extra Fine	137.9	63	38.1	[1.50"]	3.0	5	2
160	**WSX445R16007FA**	★	Y	7	Coarse	172.9	63	50.8	[2.00"]	4.9	5	2
160	**WSX445R16010FA**	★	Y	10	Fine	172.9	63	50.8	[2.00"]	4.8	5	2
160	**WSX445R16016FA**	★	Y	16	Extra Fine	172.8	63	50.8	[2.00"]	4.6	5	2
200	**WSX445R20008KN**	★	N	8	Coarse	212.9	63	47.625	[1.85"]	8.7	5	3
200	**WSX445R20012KN**	★	N	12	Fine	212.9	63	47.625	[1.85"]	8.6	5	3
200	**WSX445R20020KN**	★	N	20	Extra Fine	212.8	63	47.625	[1.85"]	8.4	5	3
NEW 250	**WSX445R25010KN**	★	N	10	Coarse	262.9	63	47.625	[1.85"]	13.1	5	3
NEW 250	**WSX445R25014KN**	★	N	14	Fine	262.9	63	47.625	[1.85"]	13.2	5	3
NEW 315	**WSX445R31514PN**	★	N	14	Coarse	327.9	63	47.625	[1.85"]	21.5	5	4

■Arbor Type
Left Hand Tool Holder

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	✶1 Coolant Thru	✶2 No.T	Pitch	DCX	LF	DCON		WT(kg)	APMX	Fig.
80	**WSX445L08004CA**	★	Y	4	Coarse	92.9	50	25.4	[1.00"]	1.3	5	1
100	**WSX445L10005DA**	★	Y	5	Coarse	112.9	50	31.75	[1.25"]	1.8	5	2
125	**WSX445L12506EA**	★	Y	6	Coarse	137.9	63	38.1	[1.50"]	3.2	5	2
160	**WSX445L16007FA**	★	Y	7	Coarse	172.9	63	50.8	[2.00"]	4.9	5	2
200	**WSX445L20008KN**	★	N	8	Coarse	212.9	63	47.625	[1.85"]	8.7	5	3
NEW 250	**WSX445L25010KN**	★	N	10	Coarse	262.9	63	47.625	[1.85"]	13.1	5	3

✶1 Y=Yes, N=No
✶2 Number of Teeth
(Note1) Set bolt not included.

★ : Stocked in Japan

Fig.3
ø200
ø250

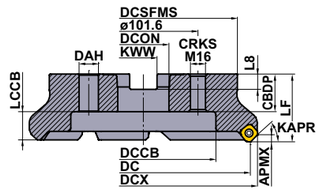
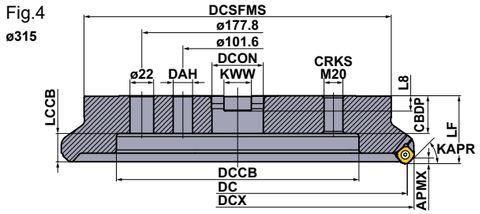
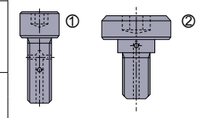


Fig.4
ø315



Right hand tool holder shown.

DC	Set Bolt	Geometry	
ϕ80	HSC12035H	①	
ϕ100	MBA16033H	②	
ϕ125	MBA20040H		
ϕ160	MBA24045H		
ϕ200	—	—	
ϕ250	—		
ϕ315	—		

Arbor Type Mounting Dimensions

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
25.4	80	**WSX445R08004CA**	26	13	20	34	56	9.5	6	1
25.4	80	**WSX445R08006CA**	26	13	20	34	56	9.5	6	1
25.4	80	**WSX445R08008CA**	26	13	20	34	56	9.5	6	1
31.75	100	**WSX445R10005DA**	32	26	45	37	70	12.7	8	2
31.75	100	**WSX445R10007DA**	32	26	45	37	70	12.7	8	2
31.75	100	**WSX445R10010DA**	32	26	45	37	70	12.7	8	2
38.1	125	**WSX445R12506EA**	36	30	56	42	80	15.9	10	2
38.1	125	**WSX445R12508EA**	36	30	56	42	80	15.9	10	2
38.1	125	**WSX445R12512EA**	36	30	56	42	80	15.9	10	2
50.8	160	**WSX445R16007FA**	38	40	72	45	100	19.1	11	2
50.8	160	**WSX445R16010FA**	38	40	72	45	100	19.1	11	2
50.8	160	**WSX445R16016FA**	38	40	72	45	100	19.1	11	2
47.625	200	**WSX445R20008KN**	35	18	135	26.3	175	25.4	14.22	3
47.625	200	**WSX445R20012KN**	35	18	135	26.3	175	25.4	14.22	3
47.625	200	**WSX445R20020KN**	35	18	135	26.3	175	25.4	14.22	3
47.625	250	**WSX445R25010KN**	35	18	180	26.3	220	25.4	14.22	3
47.625	250	**WSX445R25014KN**	35	18	180	26.3	220	25.4	14.22	3
47.625	315	**WSX445R31514PN**	35	18	225	26.3	285	25.4	14.22	4

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
25.4	80	**WSX445L08004CA**	26	13	20	34	56	9.5	6	1
31.75	100	**WSX445L10005DA**	32	26	45	37	70	12.7	8	2
38.1	125	**WSX445L12506EA**	36	30	56	42	80	15.9	10	2
50.8	160	**WSX445L16007FA**	38	40	72	45	100	19.1	11	2
47.625	200	**WSX445L20008KN**	35	18	135	26.3	175	25.4	14.22	3
47.625	250	**WSX445L25010KN**	35	18	180	26.3	220	25.4	14.22	3

General Purpose Double-sided Insert Type Face Mill Features Low Cutting Resistance

Metric Standard
For metric arbors

Fig.1
ø40
ø50
ø63
ø80

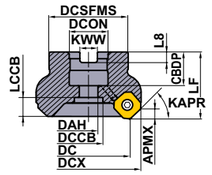
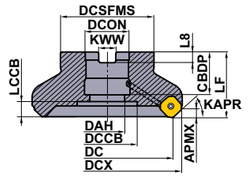


Fig.2
ø100
ø125



Right hand tool holder shown.

Fig.3
ø160

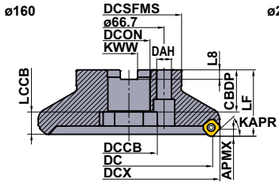
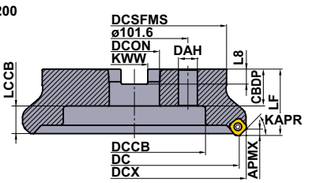
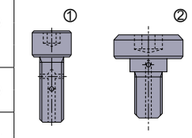


Fig.4
ø200



Right hand tool holder shown.

DC	Set Bolt	Geometry	
ϕ40	HSC08025H	①	
ϕ50	HSC10030H		
ϕ63	HSC10030H		
ϕ80	HSC12035H		
ϕ100	MBA16033H	②	
ϕ125	MBA20040H		
ϕ160	–	–	
ϕ200	–		

■Arbor Type Right Hand Tool Holder

GAMP:+17°
GAMF:-6°—+1°

DC=mm size, DCON=mm size (mm)

DC	Order Number	Stock	✶1 Coolant Thru	✶2 No.T	Pitch	DCX	LF	DCON	WT(kg)	APMX	Fig.
40	**WSX445-040A03AR**	★	Y	3	Coarse	52.8	40	16	0.3	5	1
40	**WSX445-040A04AR**	★	Y	4	Fine	52.8	40	16	0.3	5	1
50	**WSX445-050A03AR**	★	Y	3	Coarse	62.9	40	22	0.5	5	1
50	**WSX445-050A04AR**	★	Y	4	Fine	62.9	40	22	0.4	5	1
50	**WSX445-050A05AR**	★	Y	5	Extra Fine	62.9	40	22	0.4	5	1
63	**WSX445-063A04AR**	★	Y	4	Coarse	75.9	40	22	0.6	5	1
63	**WSX445-063A05AR**	★	Y	5	Fine	75.9	40	22	0.6	5	1
63	**WSX445-063A06AR**	★	Y	6	Extra Fine	75.9	40	22	0.6	5	1
80	**WSX445-080A04AR**	★	Y	4	Coarse	92.9	50	27	1.3	5	1
80	**WSX445-080A06AR**	★	Y	6	Fine	92.9	50	27	1.2	5	1
80	**WSX445-080A08AR**	★	Y	8	Extra Fine	92.9	50	27	1.1	5	1
100	**WSX445-100B05AR**	★	Y	5	Coarse	112.9	50	32	1.9	5	2
100	**WSX445-100B07AR**	★	Y	7	Fine	112.9	50	32	1.9	5	2
100	**WSX445-100B10AR**	★	Y	10	Extra Fine	112.9	50	32	1.8	5	2
125	**WSX445-125B06AR**	★	Y	6	Coarse	137.9	63	40	3.4	5	2
125	**WSX445-125B08AR**	★	Y	8	Fine	137.9	63	40	3.4	5	2
125	**WSX445-125B12AR**	★	Y	12	Extra Fine	137.9	63	40	3.2	5	2
160	**WSX445-160C07NR**	★	N	7	Coarse	172.9	63	40	4.9	5	3
160	**WSX445-160C10NR**	★	N	10	Fine	172.9	63	40	4.8	5	3
160	**WSX445-160C16NR**	★	N	16	Extra Fine	172.8	63	40	4.6	5	3
200	**WSX445-200C08NR**	★	N	8	Coarse	212.9	63	60	7.5	5	4
200	**WSX445-200C12NR**	★	N	12	Fine	212.9	63	60	7.4	5	4
200	**WSX445-200C20NR**	★	N	20	Extra Fine	212.8	63	60	7.2	5	4

■Arbor Type Left Hand Tool Holder

DC=mm size, DCON=mm size (mm)

DC	Order Number	Stock	✶1 Coolant Thru	✶2 No.T	Pitch	DCX	LF	DCON	WT(kg)	APMX	Fig.
80	**WSX445-080A04AL**	★	Y	4	Coarse	92.9	50	27	1.3	5	1
100	**WSX445-100B05AL**	★	Y	5	Coarse	112.9	50	32	1.9	5	2
125	**WSX445-125B06AL**	★	Y	6	Coarse	137.9	63	40	3.4	5	2
160	**WSX445-160C07NL**	★	N	7	Coarse	172.9	63	40	4.9	5	3

✶1 Y=Yes, N=No ✶2 Number of Teeth
(Note1) Set bolt not included.

★ : **Stocked in Japan**

Arbor Type Mounting Dimensions

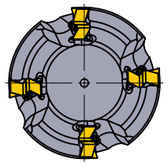
(mm)

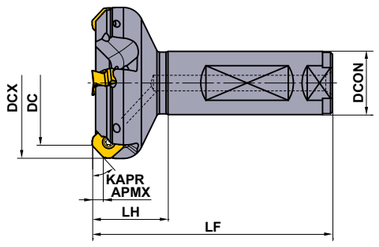
DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
16	40	**WSX445-040A03AR**	18	9	14	25	37	8.4	5.6	1
16	40	**WSX445-040A04AR**	18	9	14	25	37	8.4	5.6	1
22	50	**WSX445-050A03AR**	20	11	17	27	47	10.4	6.3	1
22	50	**WSX445-050A04AR**	20	11	17	27	47	10.4	6.3	1
22	50	**WSX445-050A05AR**	20	11	17	27	47	10.4	6.3	1
22	63	**WSX445-063A04AR**	20	11	17	27	50	10.4	6.3	1
22	63	**WSX445-063A05AR**	20	11	17	27	50	10.4	6.3	1
22	63	**WSX445-063A06AR**	20	11	17	27	50	10.4	6.3	1
27	80	**WSX445-080A04AR**	23	13	20	34	56	12.4	7	1
27	80	**WSX445-080A06AR**	23	13	13	34	56	12.4	7	1
27	80	**WSX445-080A08AR**	23	13	20	34	56	12.4	7	1
32	100	**WSX445-100B05AR**	26	26	45	32	78	14.4	8	2
32	100	**WSX445-100B07AR**	26	26	45	32	78	14.4	8	2
32	100	**WSX445-100B10AR**	26	26	45	32	78	14.4	8	2
40	125	**WSX445-125B06AR**	28	30	56	40	89	16.4	9	2
40	125	**WSX445-125B08AR**	28	30	56	40	89	16.4	9	2
40	125	**WSX445-125B12AR**	28	30	56	40	89	16.4	9	2
40	160	**WSX445-160C07NR**	40	–	56	–	100	16.4	9	3
40	160	**WSX445-160C10NR**	40	–	56	–	100	16.4	9	3
40	160	**WSX445-160C16NR**	40	–	56	–	100	16.4	9	3
60	200	**WSX445-200C08NR**	32	–	135	–	160	25.7	14.22	4
60	200	**WSX445-200C12NR**	32	–	135	–	160	25.7	14.22	4
60	200	**WSX445-200C20NR**	32	–	135	–	160	25.7	14.22	4

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
27	80	**WSX445-080A04AL**	23	13	20	34	56	12.4	7	1
32	100	**WSX445-100B05AL**	26	26	45	32	78	14.4	8	2
40	125	**WSX445-125B06AL**	28	30	56	40	89	16.4	9	2
40	160	**WSX445-160C07NL**	40	–	56	–	100	16.4	9	3

General Purpose Double-sided Insert Type Face Mill Features Low Cutting Resistance





Right hand tool holder only.

■ Shank Type

(inch)

Type	Order Number	Stock R	✶1 Coolant Thru	✶2 No.T	DC	DCX	LF	DCON	LH	WT (lbs)	APMX
Coarse Pitch	**WSX445UR2403FA20M**	●	Y	3	1.500	2.005	4.750	1.250	1.500	1.698	.197
	WSX445UR3203FA20M	●	Y	3	2.000	2.506	4.750	1.250	1.500	2.050	.197
	WSX445UR4004FA20M	●	Y	4	2.500	3.006	4.750	1.250	1.500	2.469	.197
	WSX445UR4804FA20M	●	Y	4	3.000	3.506	4.750	1.250	1.500	2.976	.197
Fine Pitch	**WSX445UR2404FA20M**	●	Y	4	1.500	2.005	4.750	1.250	1.500	1.631	.197
	WSX445UR3204FA20M	●	Y	4	2.000	2.506	4.750	1.250	1.500	1.984	.197
	WSX445UR4005FA20M	●	Y	5	2.500	3.006	4.750	1.250	1.500	2.381	.197
	WSX445UR4806FA20M	●	Y	6	3.000	3.506	4.750	1.250	1.500	2.844	.197

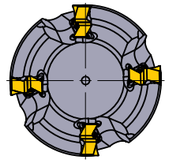
✶1 Y=Yes, N=No
✶2 Number of Teeth

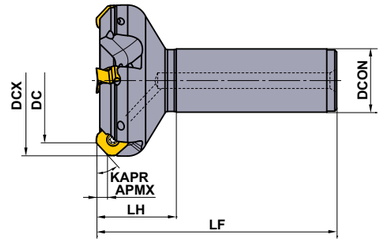
Spare Parts

Tool Holder Type	✶  Clamp Screw	 Wrench (Insert)
WSX445	TPS4R	TIP15W

✶ Clamp Torque (lbf-in) : TPS4R=31

● : USA Stock ★ : Stocked in Japan





Right hand tool holder only.

Metric Standard

■ Straight Shank Type

(mm)

Type	Order Number	Stock R	✶1 Coolant Thru	✶2 No.T	DC	DCX	LF	DCON	LH	WT (kg)	APMX
Coarse Pitch	**WSX445R4003SA32M**	★	Y	3	40	52.8	125	32	40	0.84	5
	WSX445R5003SA32M	★	Y	3	50	62.9	125	32	40	0.98	5
	WSX445R6304SA32M	★	Y	4	63	75.9	125	32	40	1.18	5
	WSX445R8004SA32M	★	Y	4	80	92.9	125	32	40	1.51	5
Fine Pitch	**WSX445R4004SA32M**	★	Y	4	40	52.8	125	32	40	0.81	5
	WSX445R5004SA32M	★	Y	4	50	62.9	125	32	40	0.95	5
	WSX445R6305SA32M	★	Y	5	63	75.9	125	32	40	1.15	5
	WSX445R8006SA32M	★	Y	6	80	92.9	125	32	40	1.45	5

✶1 Y=Yes, N=No
✶2 Number of Teeth

General Purpose Double-sided Insert Type Face Mill Features Low Cutting Resistance

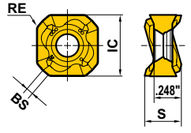
■ Inserts with Breaker

(inch)

Workpiece Material		
P	Steels	
M	Stainless Steels	
K	Cast Irons	
N	Non-ferrous Metals	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steels	

Cutting Conditions :
● : Stable Cutting ◔ : General Cutting
✲ : Unstable Cutting

Edge Preparation (Honing) :
E : Round **F :** Sharp

Shape	Order Number	Class	Hand	Edge Preparation	Coated MC5020	Coated MP6120	Coated MP6130	Coated MP7130	Coated MP7140	Coated MP9120	Coated MP9130	Coated VP15TF	Coated VP20RT	Cermet MX3030	Cermet	Carbide TF15	Carbide	IC	S	BS	RE	Geometry
	**SNGU140812ANFR-L**	G	R	F												●		.551	.331	.059	.047	
	SNGU140812ANER-L	G	R	E	●	●	●	●	●	●	●	●	●	●				.551	.331	.059	.047	
	SNGU140812ANER-M	G	R	E	●	●	●	●	●	●	●	●	●	●				.551	.331	.059	.047	
	SNMU140812ANER-M	M	R	E	●	●	●	●	●	●	●	●	●	●				.551	.331	.059	.047	
	SNMU140812ANER-R	M	R	E	●	●	●					●	●					.551	.331	.059	.047	
	SNMU140812ANER-H	M	R	E	●	●	●					●	●					.551	.331	.059	.047	
	SNGU140812ANFL-L	G	L	F												●		.551	.331	.059	.047	
	SNGU140812ANEL-L	G	L	E	●	●	●					●		●				.551	.331	.059	.047	
	SNGU140812ANEL-M	G	L	E	●	●	●					●		●				.551	.331	.059	.047	
	SNMU140812ANEL-M	M	L	E	●	●	●					●		●				.551	.331	.059	.047	
	SNMU140812ANEL-R	M	L	E	●	●	●					●						.551	.331	.059	.047	

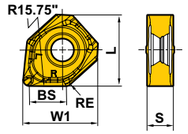
Right hand insert shown.

■ Wiper Inserts

(inch)

Workpiece Material		
P	Steels	
M	Stainless Steels	
K	Cast Irons	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steels	

Cutting Conditions :
● : Stable Cutting ◔ : General Cutting
✲ : Unstable Cutting
Edge Preparation (Honing) :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated MC5020	Coated MP6120	Coated VP15TF	Cermet MX3020	L	W1	S	BS	RE	Geometry
	**WNGU1406ANEN8C-M**	G	E	●	●	●	●	.664	.664	.236	.315	.039	

Instructions for Use of Wiper Inserts

Fig.1

Fig.2

Wiper inserts for WSX445 are two-cornered. Please set as shown in Fig.1.
Excellent surface finish can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than .315 IPR.

● : USA Stock
(10 inserts in one case)

General Purpose Double-sided Insert Type Face Mill Features Low Cutting Resistance

Recommended Cutting Conditions

■ Dry Cutting

(inch)

Workpiece Material		Properties	Grade		vc (SFM)	Finish Cutting			Light Cutting		Medium Cutting		Rough Cutting		Heavy Cutting	
						fz (IPT)	ap		fz (IPT)	ap	fz (IPT)	ap	fz (IPT)	ap	fz (IPT)	ap
P						L Breaker			L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	Mild Steels	Hardness ≤180HB	MP6120	VP15TF	820 (655—985)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MP6130	VP20RT	785 (620—950)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MX3030	—	590 (425—755)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Carbon Steels Alloy Steels	Hardness 180—350HB	MP6120	VP15TF	720 (560—885)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MP6130	VP20RT	655 (490—820)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MX3030	—	490 (395—590)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Alloy Tool Steels	Hardness ≤ 350HB (Annealing)	MP6120	VP15TF	720 (560—885)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MP6130	VP20RT	655 (490—820)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MX3030	—	490 (395—590)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Pre-hardened Steels	Hardness 35—45HRC	MP6120	VP15TF	460 (330—590)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MP6130	VP20RT	395 (295—490)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
M						L Breaker			L,M Breaker		M Breaker					
	Austenitic Stainless Steels	Hardness ≤200HB	MP7130	VP15TF	655 (490—820)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MP7140	VP20RT	655 (490—820)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MX3030	—	425 (330—590)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	—	—	—	—	—	—
	Austenitic Stainless Steels	Hardness >200HB	MP7130	VP15TF	560 (395—720)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MP7140	VP20RT	560 (395—720)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Duplex Stainless Steels	Hardness ≤ 280HB	MP7130	VP15TF	525 (360—690)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MP7140	VP20RT	525 (360—690)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Precipitation Hardening Stainless Steels	Hardness < 450HB	MP7130	VP15TF	490 (330—655)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MP7140	VP20RT	490 (330—655)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
K						L Breaker			L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	Gray Cast Irons	Tensile Strength ≤350MPa	MC5020	—	220 (200—270)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			VP15TF	—	180 (130—250)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			VP20RT	—	170 (120—240)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MX3030	—	150 (120—180)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Ductile Cast Irons	Tensile Strength ≤450MPa	MC5020	—	200 (180—250)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			VP15TF	VP20RT	160 (110—240)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	Ductile Cast Irons	Tensile Strength ≤800MPa	MC5020	—	200 (180—250)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			VP15TF	—	160 (110—240)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			VP20RT	—	150 (100—200)	.006 (.004—.008)	≤.039		.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
H						M Breaker			M,R Breaker		R,H Breaker					
	Hardened Steels	Hardness 40—55HRC	VP15TF	—	50 (30—70)	.002 (.002—.004)	≤.039		.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—
	Hardened Steels	Hardness 55—62HRC	VP15TF	—	40 (20—50)	.002 (.002—.004)	≤.039		.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—

General Purpose Double-sided Insert Type Face Mill Features Low Cutting Resistance

Recommended Cutting Conditions

■ Wet Cutting

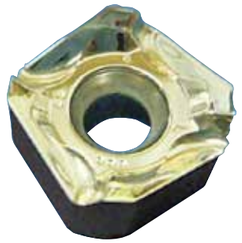
(inch)

Workpiece Material		Properties	Grade		vc (SFM)	Finish Cutting		Light Cutting		Medium Cutting		Rough Cutting		Heavy Cutting	
						fz (IPT)	ap	fz (IPT)	ap	fz (IPT)	ap	fz (IPT)	ap	fz (IPT)	ap
P						L Breaker		L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	Mild Steels	Hardness ≤ 180HB	MP6120	VP15TF	490 (330—655)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MP6130	VP20RT	490 (330—655)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	Carbon Steels Alloy Steels	Hardness 180—350HB	MP6120	VP15TF	395 (260—525)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MP6130	VP20RT	395 (260—525)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	Alloy Tool Steels	Hardness ≤ 350HB (Annealing)	MP6120	VP15TF	395 (260—525)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MP6130	VP20RT	395 (260—525)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	Pre-hardened Steels	Hardness 35—45HRC	MP6120	VP15TF	330 (260—395)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			MP6130	VP20RT	330 (260—395)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
M						L Breaker		L,M Breaker		M Breaker					
	Austenitic Stainless Steels	Hardness ≤ 200HB	MP7130	VP15TF	425 (260—590)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MP7140	VP20RT	425 (260—590)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Austenitic Stainless Steels	Hardness > 200HB	MP7130	VP15TF	330 (260—490)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MP7140	VP20RT	330 (260—490)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Duplex Stainless Steels	Hardness ≤ 280HB	MP7130	VP15TF	330 (260—490)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MP7140	VP20RT	330 (260—490)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	Precipitation Hardening Stainless Steels	Hardness < 450HB	MP7130	VP15TF	295 (165—460)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
			MP7140	VP20RT	295 (165—460)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
K						L Breaker		L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	Gray Cast Irons	Tensile Strength ≤350MPa	MC5020	—	590 (525—655)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			VP15TF	VP20RT	425 (330—525)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	Ductile Cast Irons	Tensile Strength ≤450MPa	MC5020	—	590 (525—655)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			VP15TF	VP20RT	425 (330—525)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	Ductile Cast Irons	Tensile Strength ≤ 800MPa	MC5020	—	590 (525—655)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
			VP15TF	VP20RT	360 (260—460)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
N						L Breaker		L Breaker		L Breaker		L Breaker		L Breaker	
	Aluminum Alloys	—	TF15	—	1640 (655—3280)	.006 (.004—.008)	≤.039	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
S						L Breaker		L,M Breaker		M Breaker					
	Titanium Alloys	—	MP9120	VP15TF	165 (130—195)	.002 (.002—.004)	≤.039	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—
			MP9130	VP20RT	165 (130—195)	.002 (.002—.004)	≤.039	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—
	Heat Resistant Alloys	—	MP9120	VP15TF	130 (65—165)	.002 (.002—.004)	≤.039	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—
			MP9130	VP20RT	130 (65—165)	.002 (.002—.004)	≤.039	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—

Cutting Performance

Comparison of Finished Surface - Aluminum Alloy (AISI 6061)

Chip Breaker for Aluminum Alloy

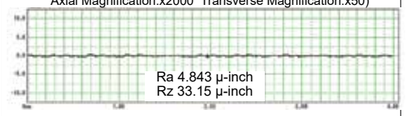
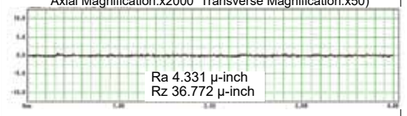
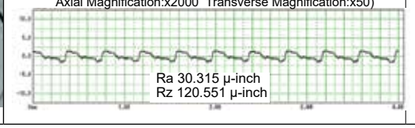


Polished Rake Face

→Improved Welding Resistance

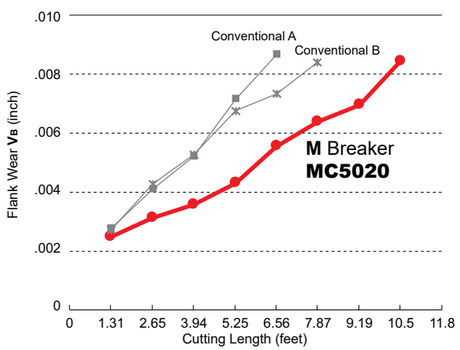
Sharp Edge

→Provides Smooth Cutting

Insert	Surface	Measured Value	Surface Roughness	Surface Quality
L Breaker **TF15**		(μ-inch) Roughness Profile Axial Magnification:x2000 Transverse Magnification:x50)  Ra 4.843 μ-inch Rz 33.15 μ-inch	○	○
Conventional A		(μ-inch) Roughness Profile Axial Magnification:x2000 Transverse Magnification:x50)  Ra 4.331 μ-inch Rz 36.772 μ-inch	○	× Cloudiness
Conventional B		(μ-inch) Roughness Profile Axial Magnification:x2000 Transverse Magnification:x50)  Ra 30.315 μ-inch Rz 120.551 μ-inch	× Rough	○

<Cutting Conditions>
Cutter Dia. : DC=5 inch
Cutting Speed : vc=1640 SFM
Feed per Tooth : fz=.004 IPT
Depth of Cut : ap=.079 inch
Width of Cut ae=3.937 inch
Cutting Mode : Dry Cutting
4 inserts
Center Cut

Tool Life Comparison when Cutting Ductile Cast Iron



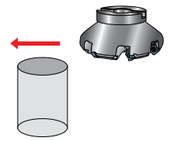
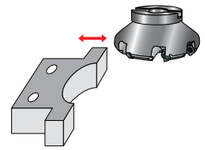
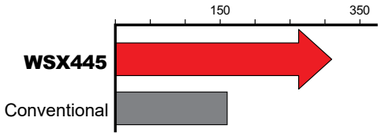
<Cutting Conditions>
Cutter Dia. : DC=5 inch
Cutting Speed : vc=655 SFM
Feed per Tooth : fz=.008 IPT
Depth of Cut : ap=.118 inch
Width of Cut : ae=3.937 inch
Cutting Mode : Dry Cutting
Single insert
Center Cut

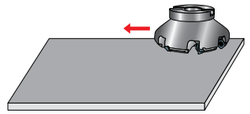
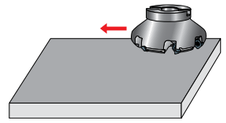
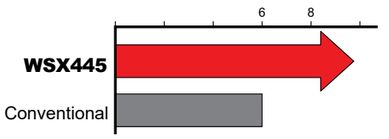
M Breaker MC5020

Conventional A

Conventional B

Application Examples

Cutter Body		WSX445-050A04AR	WSX445-080A08AR
Insert (Grade)		SNMU140812ANER-R(MP6120)	SNGU140812ANER-M (MP6120)
Workpiece		Carbon Steel 	Ductile Cast Iron 
Component		Round Bar	Automotive Component
Cutting Conditions	Cutting Speed **vc** (SFM)	620	655
	Feed per Tooth **fz** (IPT)	.008	.016
	Depth of Cut (inch)	ap=.079, ae=.984	ap=.079, ae=2.36
Cutting Mode		Dry Cutting	Dry Cutting
Results		The low cutting resistance enabled WSX445 double-sided inserts to be used with smaller BT30 arbors. Previously, only positive type single-sided inserts could be used, therefore doubling the number of cutting edges available.	Number of Workpieces (pcs. /corner)  WSX445 achieved double tool life compared to conventional product without insert fracturing in interrupted machining.

Cutter Body		WSX445R12508EA	WSX445R10007DA
Insert (Grade)		SNGU140812ANER-M (MP6120)	SNGU140812ANER-L (MP9120)
Workpiece		Carbon Steel 	Precipitation Hardening Stainless Steel 
Component		Thin Plate	Aerospace Component
Cutting Conditions	Cutting Speed **vc** (SFM)	710	150
	Feed per Tooth **fz** (IPT)	.012	.012
	Depth of Cut (inch)	ap=.059 – .098, ae=4.72	ap=.079 – .118, ae=3.15
Cutting Mode		Dry Cutting	Wet Cutting
Results		Spindle load could be reduced to 80% of conventional product, as WSX445 offers improved chip discharge performance resulting in smooth and silent machining.	Number of Workpieces (pass)  Number of workpieces increased by 1.5 times or more since WSX445 prevents thermal cracking.

The above application examples are customer's applications, so it can be different from the recommended conditions.

Memo

Memo

DIA EDGE

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For Your Safety

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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Tools specifications subject to change without notice.

B220A-US-2020.4