MITSUBISHI
MITSUBISHI MATERIALS

TOOL NEWS 2012.11 Update B183A

Strong Edge Insert Type Cutter for Cast Iron

VOX400

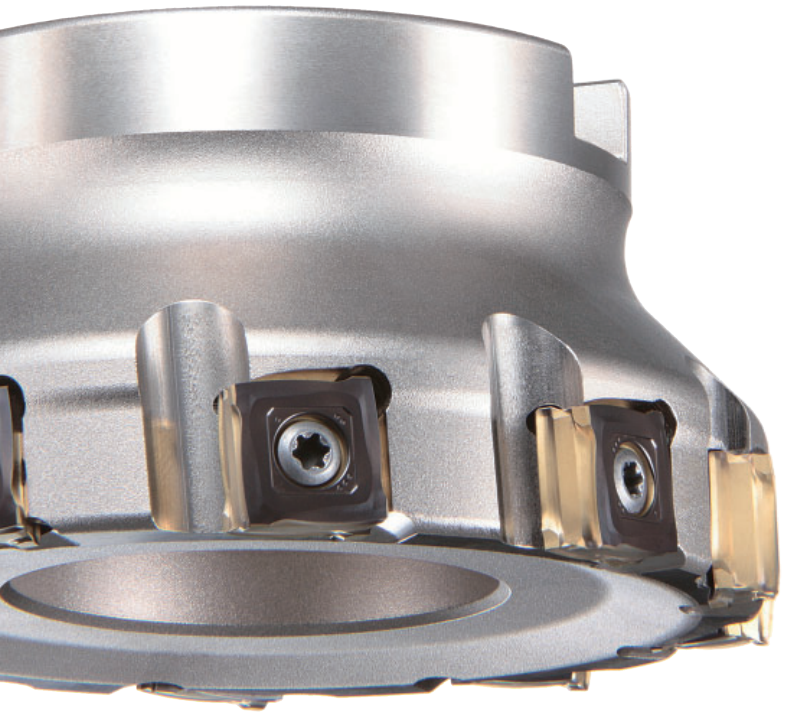
Series Expansion

New style face mill for cast iron milling

VOX cutter with vertical inserts for ultra high efficiency.

Vertical mounted inserts with ideal cutting edge is suitable for a wide range of cast iron rough milling applications

VOX400



Features of Cutter body

High rigidity design

Arranging the inserts vertically absorbs the principal cutting force through the thickness of the insert and achieves extremely high rigidity.

Easy to clamp insert

Inserts are screwed into the side of the holder, this simplifies clamping and unclamping for superior usability.

Wide selection of bodies

VOX400 meets the needs of a wide range of cast iron roughing applications with a coarse pitch type and a high-productivity fine pitch type.

Features of Insert

Long life insert grade

MC5020

- 1st recommendation for cast iron machining.
- Black super even coating technology is utilized to help prevent chip welding for long tool life.
- Dry cutting is recommended.

NEW

VP15TF

- A PVD coated grade for application versatility.
- Ideal for ductile cast iron, unstable cutting conditions and low rigidity work pieces.
- Wet cutting is possible.

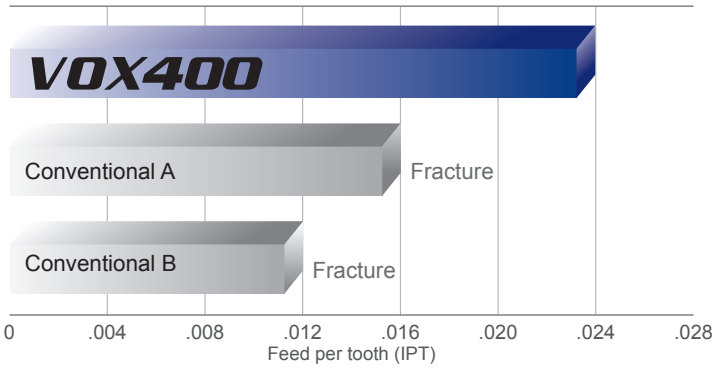
Unique vertical insert

- 8 usable corners with high strength cutting edge.
- The fracture resistance is significantly improved due to a convex curve cutting edge and a specially shaped relief face.
- Maximum depth of cut is 10mm.

Efficient cutting performance

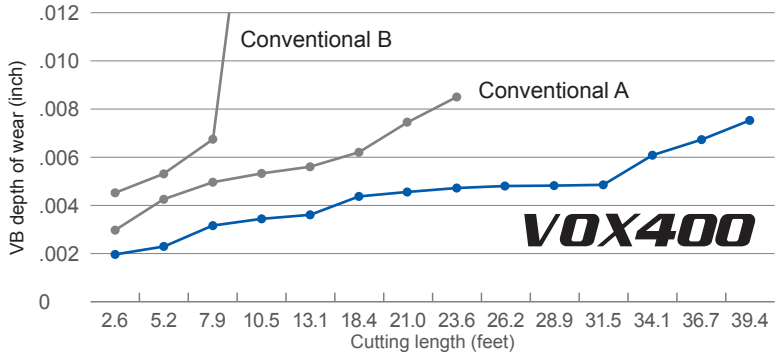
The original insert shape with convex cutting edge and shaped relief face offers excellent sharpness and extraordinary fracture resistance.

Fracture resistance



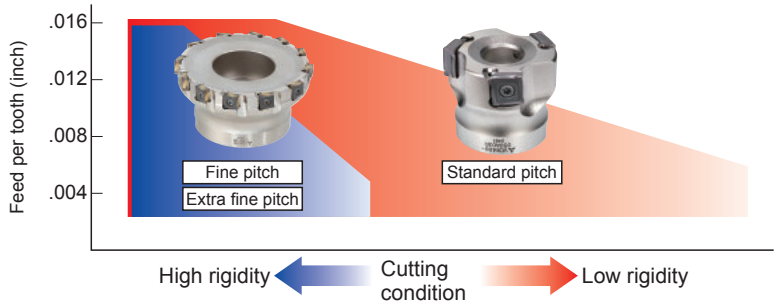
<Cutting Conditions>
Tool : VOX400UR0308C(ø80)
Insert : SONX1206PER(MC5020)
Work piece : Ductile iron
Cutting Speed : 655 SFM
Feed : Var.
Depth of Cut : ap=.197 inch, ae=1.575 inch
Coolant : Dry Cut

Test results of VP15TF tool life



<Cutting Conditions>
Tool : VOX400UR0308C(ø80)
Insert : SONX1206PER(VP15TF)
Work piece : Ductile iron
Cutting Speed : 390 SFM
Feed : .008 IPT
Depth of Cut : ap=.12 inch, ae=1.969 inch
Coolant : Wet Cut

Selection of number of teeth

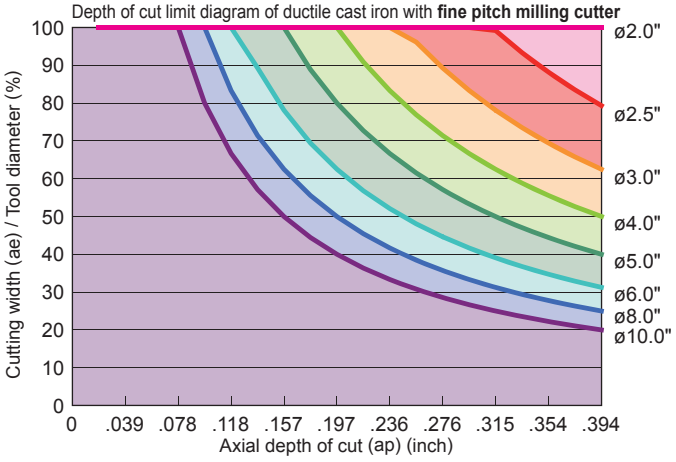


With stable work piece and machine conditions, it is possible to increase the number of teeth used to promote higher efficiency. In these cases we recommend fine and super fine pitch cutters when machining gray cast iron.

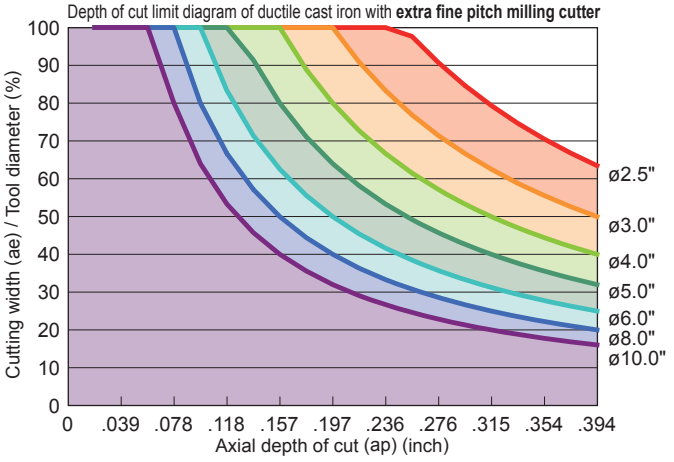
How to use fine pitch and extra fine pitch.

When using fine and extra fine pitch cutters, care must be taken regarding elongated chips on materials such as FCD because the chip pocket is relatively small.
Refer to the charts below and ensure the axial depth and percentage of width of the cutter is not exceeded.

Depth of cut limit diagram of ductile cast iron with **fine pitch milling cutter**



Depth of cut limit diagram of ductile cast iron with **extra fine pitch milling cutter**



Strong Edge Insert Type Cutter for Cast Iron

VOX400

ARBOR TYPE

Fig.1

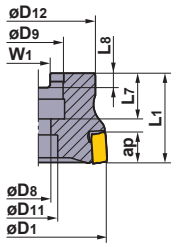


Fig.2

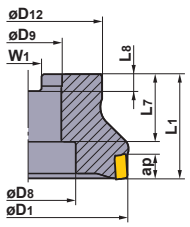
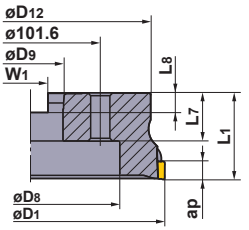


Fig.3

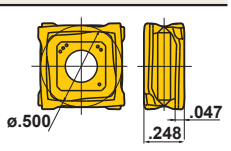


Right hand tool holder only.

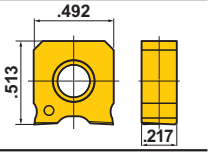
Light Alloy	Cast Iron	Carbon Steel · Alloy Steel	Stainless Steel	Hardened Steel
	▬			

Type	Order Number	Stock	Number of Teeth	Dimensions (inch)									Mass (lbs)	Max. Depth of Cut **ap** (inch)	Fig.
		R		D1	L1	D9	L7	D8	D11	D12	W1	L8			
Coarse Pitch	**VOX400UR0203C**	●	3	2.000	2.000	1.000	1.339	.539	.787	2.190	.375	.219	.8	.394	1
	2504C	●	4	2.500	2.000	1.000	1.339	.539	.787	2.190	.375	.219	1.7	.394	1
	0304C	●	4	3.000	2.000	1.000	1.339	.539	.787	2.190	.375	.219	2.2	.394	1
	0406E	●	6	4.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	4.3	.394	2
	0508E	●	8	5.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	6.0	.394	2
	0610F	●	10	6.000	2.500	2.000	1.024	3.228	—	4.880	.750	.437	10.2	.394	2
	0812M	●	12	8.000	2.500	2.500	1.378	5.512	—	6.890	1.000	.560	17.6	.394	3
	1016M	●	16	10.000	2.500	2.500	1.378	7.078	—	8.660	1.000	.560	29.4	.394	3
Fine Pitch	**VOX400UR0205C**	●	5	2.000	2.000	1.000	1.339	.539	.787	2.190	.375	.219	.8	.394	1
	2506C	●	6	2.500	2.000	1.000	1.339	.539	.787	2.190	.375	.219	1.7	.394	1
	0308C	●	8	3.000	2.000	1.000	1.339	.539	.787	2.190	.375	.219	2.2	.394	1
	0410E	●	10	4.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	4.3	.394	2
	0512E	●	12	5.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	6.0	.394	2
	0616F	●	16	6.000	2.500	2.000	1.024	3.228	—	4.880	.750	.437	10.2	.394	2
	0820M	●	20	8.000	2.500	2.500	1.378	5.512	—	6.890	1.000	.560	17.6	.394	3
	1024M	●	24	10.000	2.500	2.500	1.378	7.078	—	8.660	1.000	.560	29.4	.394	3
Extra Fine Pitch	NEW **VOX400UR2508C**	●	8	2.500	2.000	1.000	1.024	.539	.787	2.190	.375	.219	1.5	.394	1
	0310C	●	10	3.000	2.000	1.000	1.024	.539	.787	2.190	.375	.219	2.0	.394	1
	0412E	●	12	4.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	4.1	.394	2
	0516E	●	16	5.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	5.6	.394	2
	0620F	●	20	6.000	2.500	2.000	1.024	3.228	—	4.880	.75	.437	9.8	.394	2
	0826M	●	26	8.000	2.500	2.500	1.378	5.512	—	6.890	1.000	.560	17.1	.394	3
	1034M	●	34	10.000	2.500	2.500	1.378	7.087	—	8.660	1.000	.560	28.7	.394	3

INSERTS

Shape	Order Number	Class	Horning	Coated MC5020	Coated VP15TF NEW	Geometry (inch)
	**SONX1206PER**	N	E	●	●	

WIPER INSERTS

Shape	Order Number	Class	Horning	Coated MC5020	Coated VP15TF	Geometry (inch)
NEW 	**WOEX1206PER5C**	E	E		●	

● : Inventory maintained. (10 inserts in a case) ★ : Inventory maintained in Japan.

ARBOR TYPE

Fig.1

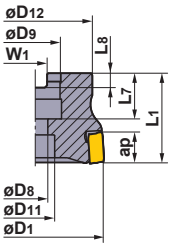


Fig.2

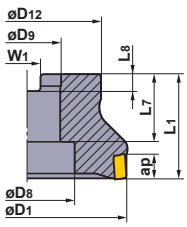
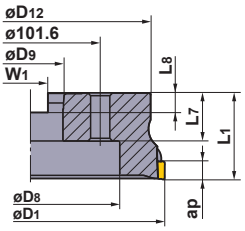


Fig.3



Right hand tool holder only.

METRIC Standard

For inch arbors

Light Alloy	Cast Iron	Carbon Steel · Alloy Steel	Stainless Steel	Hardened Steel
	▬			

Type	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]									Mass (kg)	Max. Depth of Cut **ap** (mm)	Fig.
		R		D1	L1	D9	L7	D8	D11	D12	W1	L8			
Coarse Pitch	**VOX400R08004C**	★	4	80	50	25.4 [1.0"]	26	13	20	55	9.5	6	1.0	10	1
	R10006D	★	6	100	50	31.75 [1.25"]	32	45	—	70	12.7	8	1.5	10	2
	R12508E	★	8	125	63	38.1 [1.5"]	40	60	—	80	15.9	10	2.7	10	2
	R16010F	★	10	160	63	50.8 [2.0"]	43	80	—	120	19.1	11	5.3	10	2
	R20012K	★	12	200	63	47.625 [1.875"]	35	130	—	175	25.4	14.22	8.5	10	3
	R25016K	★	16	250	63	47.625 [1.875"]	35	180	—	220	25.4	14.22	13.3	10	3
Fine Pitch	**VOX400R08008C**	★	8	80	50	25.4 [1.0"]	26	13	20	55	9.5	6	1.0	10	1
	R10010D	★	10	100	50	31.75 [1.25"]	32	45	—	70	12.7	8	1.5	10	2
	R12512E	★	12	125	63	38.1 [1.5"]	40	60	—	80	15.9	10	2.7	10	2
	R16016F	★	16	160	63	50.8 [2.0"]	43	80	—	120	19.1	11	5.3	10	2
	R20020K	★	20	200	63	47.625 [1.875"]	35	130	—	175	25.4	14.22	8.5	10	3
	R25024K	★	24	250	63	47.625 [1.875"]	35	180	—	220	25.4	14.22	13.3	10	3
Extra Fine Pitch NEW	**VOX400R08010C**	★	10	80	50	25.4 [1.0"]	26	13	20	55	9.5	6	1.0	10	1
	R10012D	★	12	100	50	31.75 [1.25"]	32	45	—	70	12.7	8	1.4	10	2
	R12516E	★	16	125	63	38.1 [1.5"]	40	60	—	80	15.9	10	2.6	10	2
	R16020F	★	20	160	63	50.8 [2.0"]	43	80	—	120	19.1	11	5.1	10	2
	R20026K	★	26	200	63	47.625 [1.875"]	35	130	—	175	25.4	14.22	8.2	10	3
	R25034K	★	34	250	63	47.625 [1.875"]	35	180	—	220	25.4	14.22	13.0	10	3

SPARE PARTS

Tool Holder Number	 * Clamp Screw	 Wrench
VOX400	CS401160T	TKY15T

* Clamp Torque (lbf-in) : CS401160T=31

Strong Edge Insert Type Cutter for Cast Iron

VOX400

ARBOR TYPE

METRIC Standard

For metric arbors

Fig.1

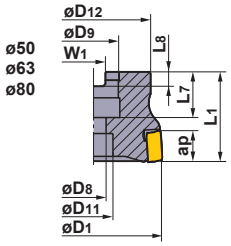
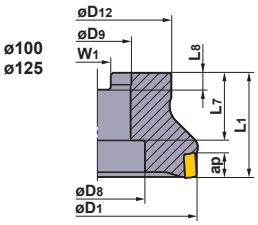
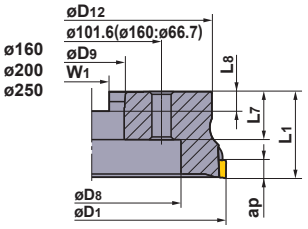


Fig.2



Right hand tool holder only.

Fig.3



Light Alloy	Cast Iron	Carbon Steel · Alloy Steel	Stainless Steel	Hardened Steel
	▬▬			

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									Mass (kg)	Max. Depth of Cut **ap** (mm)	Fig.
		R		D_1	L_1	D_9	L_7	D_8	D_{11}	D_{12}	W_1	L_8			
Coarse Pitch	**VOX400-050A03R**	★	3	50	40	22	20	11	17	50	10.4	6.3	0.3	10	1
	-063A04R	★	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1
	-080A04R	★	4	80	50	27	23	13	20	56	12.4	7	1	10	1
	-100B06R	★	6	100	50	32	32	45	—	78	14.4	8	1.7	10	2
	-125B08R	★	8	125	63	40	32	56	—	89	16.4	9	3	10	2
	-160C10R	★	10	160	63	40	29	56	—	120	16.4	9	5.4	10	3
	-200C12R	★	12	200	63	60	32	130	—	175	25.7	14.22	8.1	10	3
	-250C16R	★	16	250	63	60	32	180	—	210	25.7	14.22	11.8	10	3
Fine Pitch	**VOX400-050A05R**	★	5	50	40	22	20	11	17	50	10.4	6.3	0.3	10	1
	-063A06R	★	6	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1
	-080A08R	★	8	80	50	27	23	13	20	56	12.4	7	1	10	1
	-100B10R	★	10	100	50	32	32	45	—	78	14.4	8	1.7	10	2
	-125B12R	★	12	125	63	40	32	56	—	89	16.4	9	3	10	2
	-160C16R	★	16	160	63	40	29	56	—	120	16.4	9	5.4	10	3
	-200C20R	★	20	200	63	60	32	130	—	175	25.7	14.22	8.1	10	3
	-250C24R	★	24	250	63	60	32	180	—	210	25.7	14.22	11.8	10	3
Extra Fine Pitch	NEW **VOX400-063A08R**	★	8	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	-080A10R	★	10	80	50	27	23	13	20	56	12.4	7	1.0	10	1
	-100B12R	★	12	100	50	32	32	45	—	78	14.4	8	1.6	10	2
	-125B16R	★	16	125	63	40	32	56	—	89	16.4	9	2.8	10	2
	-160C20R	★	20	160	63	40	29	56	—	120	16.4	9	5.2	10	3
	-200C26R	★	26	200	63	60	32	130	—	175	25.7	14.22	7.9	10	3
	-250C34R	★	34	250	63	60	32	180	—	210	25.7	14.22	11.5	10	3

SPARE PARTS

Tool Holder Number	 *	
	Clamp Screw	Wrench
VOX400	CS401160T	TKY15T

* Clamp Torque (lbf-in) : CS401160T=31

★ : **Inventory maintained in Japan.**

RECOMMENDED CUTTING CONDITIONS

VOX400 (Standard pitch)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2"—ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820—1150)	≤D_1	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤D_1	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤D_1	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤D_1	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤D_1	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤D_1	≤.394	.008(.004—.012)

VOX400 (Fine pitch)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2.5"			ϕ3"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820—1150)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.8D_1	≤.394	.012(.008—.016)	≤0.6D_1	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.8D_1	≤.394	.012(.008—.016)	≤0.6D_1	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.8D_1	≤.394	.008(.004—.012)	≤0.6D_1	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.8D_1	≤.394	.008(.004—.012)	≤0.6D_1	≤.394	.008(.004—.012)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ4"			ϕ5"		
					Radial depth of cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820—1150)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.5D_1	≤.394	.012(.008—.016)	≤0.4D_1	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.5D_1	≤.394	.012(.008—.016)	≤0.4D_1	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.5D_1	≤.394	.008(.004—.012)	≤0.4D_1	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.5D_1	≤.394	.008(.004—.012)	≤0.4D_1	≤.394	.008(.004—.012)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ6"			ϕ8", ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820—1150)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.3D_1	≤.394	.012(.008—.016)	≤0.2D_1	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.3D_1	≤.394	.012(.008—.016)	≤0.2D_1	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.3D_1	≤.394	.008(.004—.012)	≤0.2D_1	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.3D_1	≤.394	.008(.004—.012)	≤0.2D_1	≤.394	.008(.004—.012)

- D_1 is cutter diameter.
- When using wiper insert, please reduce the feed per tooth to half the normal rate.

Strong Edge Insert Type Cutter for Cast Iron

VOX400

VOX400 (Extra fine pitch)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2.5"			ϕ3"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820－1150)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.6D_1	≤.394	.012(.008－.016)	≤0.5D_1	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.6D_1	≤.394	.012(.008－.016)	≤0.5D_1	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.6D_1	≤.394	.008(.004－.012)	≤0.5D_1	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.6D_1	≤.394	.008(.004－.012)	≤0.5D_1	≤.394	.008(.004－.012)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ4"			ϕ5"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820－1150)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.4D_1	≤.394	.012(.008－.016)	≤0.3D_1	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.4D_1	≤.394	.012(.008－.016)	≤0.3D_1	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.4D_1	≤.394	.008(.004－.012)	≤0.3D_1	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.4D_1	≤.394	.008(.004－.012)	≤0.3D_1	≤.394	.008(.004－.012)

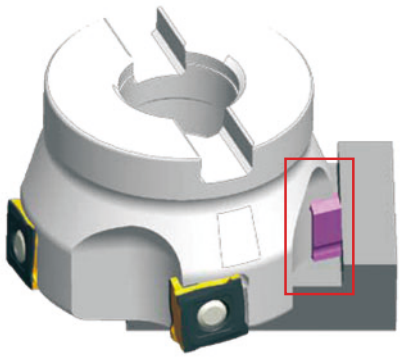
Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ6"			ϕ8", ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820－1150)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.25D_1	≤.394	.012(.008－.016)	≤0.15D_1	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.25D_1	≤.394	.012(.008－.016)	≤0.15D_1	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.25D_1	≤.394	.008(.004－.012)	≤0.15D_1	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.25D_1	≤.394	.008(.004－.012)	≤0.15D_1	≤.394	.008(.004－.012)

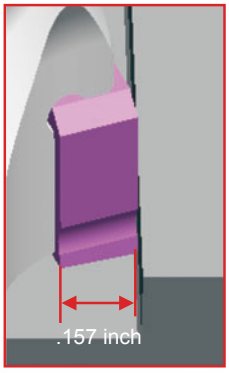
- D_1 is cutter diameter.
- When using wiper insert, please reduce the feed per tooth to half the normal rate.

Usable cutting edge width of wiper inserts

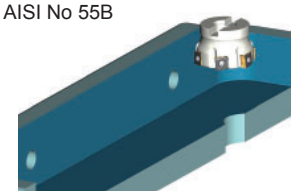
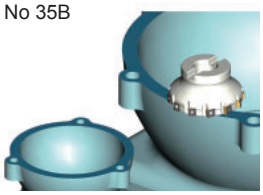
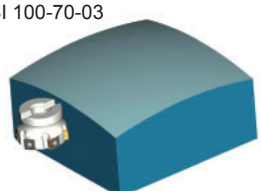
The width of the wiper insert itself is .217 inch, however the actual functioning cutting edge width after installation to the body is .177 inch, as shown in the diagram.

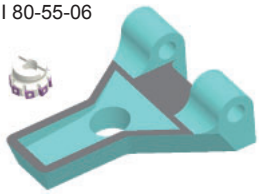
With one wiper insert, it is possible to machine up to fr=.157 inch feed per revolution. When exceeding fr=.157 inch, use two or more wiper inserts. Note that there is a possibility to exceed fr=.157 inch when using a holder with more than 24 inserts.





APPLICATION EXAMPLES

Tool		VOX400UR2506C	VOX400UR0512E	VOX400UR2506C
Work piece		AISI No 55B 	AISI No 35B 	AISI 100-70-03 
Component		Press mold base	Gear case	Press mold part
Cutting Conditions	Cutting Speed (SFM)	750	395	655
	Table Feed (IPM)	80.6	28.9	31.5
	Feed per Tooth (IPT)	.012	.008	.005
	Radial Depth of cut ap (inch)	.197	1.575	.669
	Axial Depth of cut ae (inch)	.394	.118	.118
	Coolant	Dry cutting	Dry cutting	Dry cutting
Results		Conventional products required the axial depth of cut to be set at .197" for stable milling. But the VOX400 allowed stable milling with twice the depth of cut and produced a good wall surface accuracy.	Due to the unstable work piece, conventional products were usually damaged and became unusable. VOX400 is more stable and gave 3 times tool life.	Due to high cutting resistance of some products, the width of cut was limited to .335". The VOX400 low cutting resistance design allowed for stable cutting at twice the width of cut.

Tool		VOX400-080B10R (MC5020)	VOX400-063A08R (VP15TF)	VOX400-125B16R (Wiper Insert)
Work piece		AISI No 45 B 	AISI 80-55-06 	AISI 60-40-18 
Component		Gear case	Automobile part	Exhaust part
Cutting Conditions	Cutting Speed (SFM)	2295	935-1165	770
	Table Feed (IPM)	165.4	74.8-90.6	31.1
	Feed per Tooth (IPT)	.006	.006	.004
	Radial Depth of cut ae (inch)	-	-	3.937
	Axial Depth of cut ap (inch)	.059-.079	.079-.157	.006-.010
	Coolant	Dry cutting	Dry cutting	Dry cutting
Results		Vibration and chipping occurred with conventional products due to the low rigidity clamping. VOX400 allowed a more stable cutting performance without chipping and costs were reduced by 25%.	Compared to conventional products tool life was improved 30% and cutting resistance was reduced by 25%.	The surface finish was improved compared to the conventional products.

●With reference to the above examples, adjust the cutting conditions according to the machine specifications, work piece geometry and clamping method used.

For your safety
●Don't touch breakers and chips without gloves. ●Please machine within recommended application range, and exchange expired tools with new parts in advance. ●Please use safety cover and wear safety glasses. ●When using compounded cutting oils, please take fire prevention. ●When attaching chips or spare parts, please use the attached wrench or spanner. ●When using tools in revolution machining, please make a trial run to check run-out, vibration, abnormal sounds etc.

MITSUBISHI MATERIALS CORPORATION

MITSUBISHI MATERIALS U.S.A. CORPORATION

Customer Service : 800-523-0800
Technical Service : 800-486-2341

LOS ANGELES HEAD OFFICE
11250 Slater Avenue, Fountain Valley, CA 92708
TEL : 714-352-6100 FAX : 714-668-1320

CHICAGO OFFICE
1314B North Plum Grove Road, Schaumburg, IL 60173
TEL : 847-252-6300 FAX : 847-519-1732

TORONTO OFFICE
6535, Millcreek Drive, Units, 63&64, Mississauga, Ontario L5N 2M2, Canada
TEL : 905-814-0240 FAX : 905-814-0245

MMC METAL DE MEXICO, S.A. DE C.V.
Av. La Cañada No.16, Parque Industrial Bernardo Quintana,
El Marques, Queretaro, CP76246, Mexico
TEL : +52-442-221-6136 FAX : +52-442-221-6134

URL : http://www.mitsubishicarbide.com
(Tools specifications subject to change without notice.)

EXP-10-E017
Printed in U.S.A. 10/12