



Engraving Tool >>>

30° / 45° / 60° / 90°

This is a revolutionary new concept of engraving tools with indexable carbide insert. Provide HIGH QUALITY ENGRAVING in most kinds of material. Higher speed and feed rate, dramatically reducing your cycle time.

P M K N H S

▶ **No Need To Reset After Changing Insert Or Cutting Edge**

- 2 Cutting Edges.
- Excellent repeatability!



Features >>>

▶ **High Positive Rake Angle**

- Very sharp edge for shallow engraving.
- Suitable for all types of materials, such as plastic, non-ferrous metal, aluminum, copper, carbon steel and stainless steel.

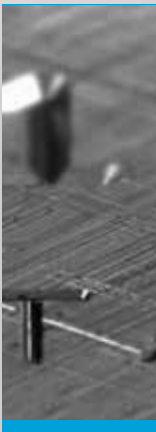
▶ **Multi-Side Grinding**

- Full peripherally ground insert to ensure efficient repeatability.
- It performs excellently without producing any burrs, especially in copper, aluminum and stainless steel.

▶ **High Speed, High Feed Rate**

- Designed to run at high speed, up to 40,000 r.p.m.
- Feed rate 0.08mm (0.003") / rev. apply to aluminum; 0.05mm (0.002") / rev. apply to stainless steel.
- Reduces engraving cycle time!

▶ **Special forms are available on request**





Applications

- Serial numbers, product codes, dial scales, signs, logo, graph and almost any character which can be created by the NC programming system.

Ultrasonic welding drum



Mold & Die



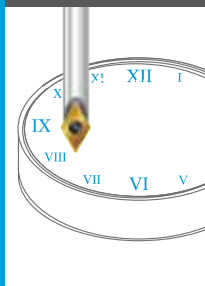
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Engraving Tool

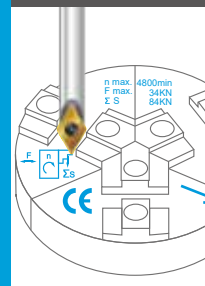


“ Widely be used for marking on machine components, medical components, gun components, mold and die, automotive parts, gears, bearings and luxury goods. ”

Dial scales



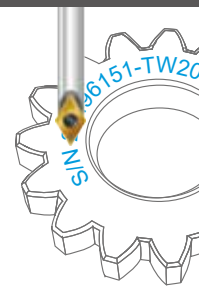
Product info



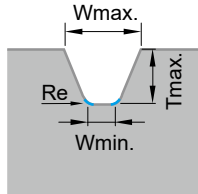





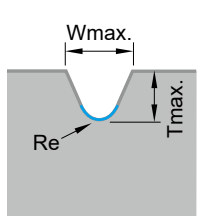



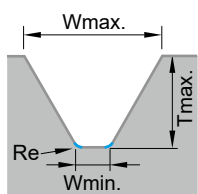


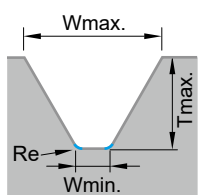

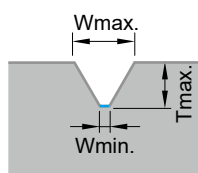



Logo outlines



Serial number



Engraving Tool System

Type	Form	Angle	Insert	Wmin.	Wmax.	Tmax.	Holder
X060 Series	 <p>Radius Angled</p>	30°	 X060A30W...	0.2 (0.008")	0.52 (0.020")	0.6 (0.024")	 99619-X060... Ø6 (0.236") Ø8 (0.315")
		45°	 X060A45W...		0.86 (0.034")	0.8 (0.031")	
		60°	 X060A60W...		1.36 (0.054")	1.0 (0.039")	
		90°	 X060A90W...		2.2 (0.087")	1.0 (0.039")	
	 <p>Radius</p>	30°	 X060A30R...	Re: 0.2 (0.008")	0.63 (0.025")	0.6 (0.024")	
		45°	 X060A45R...		0.93 (0.037")	0.8 (0.031")	
60°		 X060A60R...	1.39 (0.055")		1.0 (0.039")		
V045 V060 Series	 <p>Radius Angled</p>	45°	 V04506T1W	0.45 (0.018")	2.1 (0.083")	2.0 (0.079")	 V04506T1W Ø6 (0.236") Ø8 (0.315")
				0.65 (0.026")			
	 <p>Radius Angled / Angled</p>	60°	 V06006T1W	0.25 (0.01")	1.1 (0.043")	0.8 (0.031")	
				0.45 (0.018")			
N9MT-W Series	 <p>Angled</p>	60°	 N9MT080201W -60-NC40	0.2 (0.008")	1.1 (0.043")	0.8 (0.031")	 99616-10...SW Ø10 (0.394") Ø3/8"
		90°	 N9MT080201W	0.2 (0.008")	2.0 (0.079")	0.9 (0.035")	

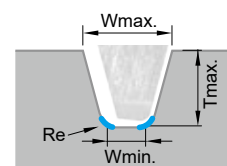
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Engraving Tool



► Inserts >>

- NC2032:** • For all kinds of steel from < 40 HRC, carbon steel, alloy steel, and cast iron.
- NC2035:** • ALDURA coating, reduces heat and tool wear.
• For steel with heat treatment up to 56 HRC.
- XP9001:** • For non-ferrous metal, aluminum, brass, copper, plastic, acrylic.



• Radius Angled Form

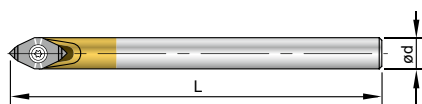
Angle	Parts No.	Coating	Grade	Diagram	Dimensions			Wmin.	Wmax.	Tmax.
					L	S	Re			
30°	X060A30W020R	NC2032	TiAlN		6 (0.236")	2.05 (0.081")	0.04 (0.0015")	0.20 (0.008")	0.52 (0.020")	0.6 (0.024")
		NC2035	ALDURA							
		XP9001	Uncoated							

• Radius Form

Angle	Parts No.	Coating	Grade	Diagram	Dimensions			R max. Depth	Wmax.	Tmax.
					L	S	Re			
30°	X060A30R020	NC2032	TiAlN		6 (0.236")	2.05 (0.081")	0.2 (0.008")	0.15 (0.006")	0.63 (0.025")	0.6 (0.024")
		NC2035	ALDURA							
		XP9001	Uncoated							

► Holder >>

- One holder supports the entire X060 series of carbide inserts.



Parts No.	Shank	Ød	L	Screw	Key
99619-X060-06	Steel	6 (0.236")	40 (1.575")	NS-22044 0.9Nm	NK-T7
99619-X060-06L	Carbide		60 (2.362")		
99619-X060-06LS	Steel	100 (3.937")			
99619-X060-06XL	Carbide				
99619-X060-08	Steel	8 (0.315")	60 (2.362")		

3

Engraving Tool

45° X060 Engraving Tool 45° **NEW**



▶ Inserts >>

- NC2032:** • For all kinds of steel from < 40 HRC, carbon steel, alloy steel, and cast iron.
- NC2035:** • ALDURA coating, reduces heat and tool wear.
• For steel with heat treatment up to 56 HRC.
- XP9001:** • For non-ferrous metal, aluminum, brass, copper, plastic, acrylic.

• Radius Angled Form

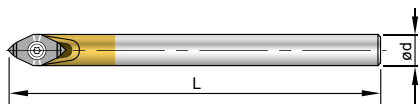
Angle	Parts No.	Coating	Grade	Re	Dimensions			Wmin.	Wmax.	Tmax.	
					L	S	Re				
45°	X060A45W020R	NC2032	TiAlN	K20F		6 (0.236")	2.05 (0.081")	0.04 (0.0015")	0.20 (0.008")	0.86 (0.034")	0.8 (0.031")
		NC2035	ALDURA								
		XP9001	Uncoated								

• Radius Form

Angle	Parts No.	Coating	Grade	Re	Dimensions			R max. Depth	Wmax.	Tmax.	
					L	S	Re				
45°	X060A45R020	NC2032	TiAlN	K20F		6 (0.236")	2.05 (0.081")	0.2 (0.008")	0.12 (0.005")	0.93 (0.037")	0.8 (0.031")
		NC2035	ALDURA								
		XP9001	Uncoated								

▶ Holder >>

- One holder supports the entire X060 series of carbide inserts.



Parts No.	Shank	Ød	L	Screw	Key
99619-X060-06	Steel	6 (0.236")	40 (1.575")	NS-22044 0.9Nm	NK-T7
99619-X060-06L	Carbide		60 (2.362")		
99619-X060-06LS	Steel		100 (3.937")		
99619-X060-06XL	Carbide	60 (2.362")			
99619-X060-08	Steel	8 (0.315")	60 (2.362")		

3

Engraving Tool



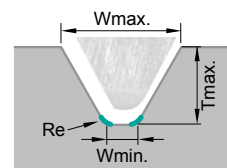
► Inserts >>

NC2032: • For all kinds of steel from < 40 HRC, carbon steel, alloy steel, and cast iron.

NC2035: • ALDURA coating, reduces heat and tool wear.
• For steel with heat treatment up to 56 HRC.

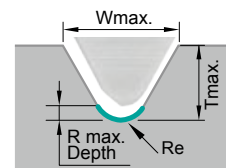
XP9001: • For non-ferrous metal, aluminum, brass, copper, plastic, acrylic.

• Radius Angled Form



Angle	Parts No.	Coating	Grade	Diagram	Dimensions			Wmin.	Wmax.	Tmax.
					L	S	Re			
60°	X060A60W020R	NC2032	TiAlN		6 (0.236")	2.05 (0.081")	0.04 (0.0015")	0.2 (0.008")	1.36 (0.054")	1.0 (0.039")
		NC2035	ALDURA							
		XP9001	Uncoated							

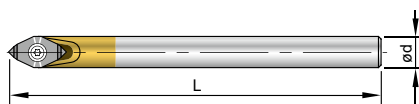
• Radius Form



Angle	Parts No.	Coating	Grade	Diagram	Dimensions			R max. Depth	Wmax.	Tmax.
					L	S	Re			
60°	X060A60R020	NC2032	TiAlN		6 (0.236")	2.05 (0.081")	0.2 (0.008")	0.1 (0.004")	1.39 (0.055")	1.0 (0.039")
		NC2035	ALDURA							
		XP9001	Uncoated							

► Holder >>

• One holder supports the entire X060 series of carbide inserts.



Parts No.	Shank	Ød	L	Screw	Key
99619-X060-06	Steel	6 (0.236")	40 (1.575")	NS-22044 0.9Nm	NK-T7
99619-X060-06L	Carbide		60 (2.362")		
99619-X060-06LS	Steel				
99619-X060-06XL	Carbide	100 (3.937")			
99619-X060-08	Steel	8 (0.315")	60 (2.362")		

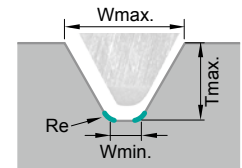
90° X060 Engraving Tool 90° **NEW**



► Inserts >>

- NC2032:** • For all kinds of steel from < 40 HRC, carbon steel, alloy steel, and cast iron.
- NC2035:** • ALDURA coating, reduces heat and tool wear.
• For steel with heat treatment up to 56 HRC.
- XP9001:** • For non-ferrous metal, aluminum, brass, copper, plastic, acrylic.

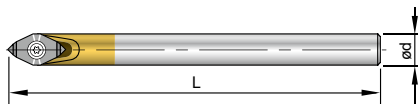
• Radius Angled Form



Angle	Parts No.	Coating	Grade	Re	Dimensions			Wmin.	Wmax.	Tmax.	
					L	S	Re				
90°	X060A90W020R	NC2032	TiAlN	K20F		6	2.05	0.04	0.2	2.2	1.0
		NC2035	ALDURA			(0.236")	(0.081")	(0.0015")	(0.008")	(0.087")	(0.039")
		XP9001	Uncoated								

► Holder >>

- One holder supports the entire X060 series of carbide inserts.



Parts No.	Shank	Ød	L	Screw	Key
99619-X060-06	Steel		40 (1.575")		
99619-X060-06L	Carbide				
99619-X060-06LS	Steel	6 (0.236")	60 (2.362")	NS-22044 0.9Nm	NK-T7
99619-X060-06XL	Carbide		100 (3.937")		
99619-X060-08	Steel	8 (0.315")	60 (2.362")		

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Engraving Tool

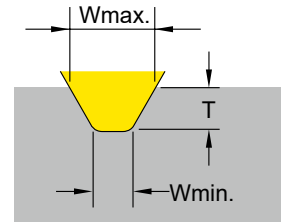
V045 Engraving Tool 45°

45°



► Inserts >>

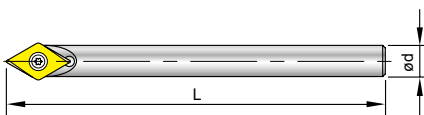
- NC2071:**
 - Strong edge on chip-breaker, best suited for min. DOC 0.2mm.
 - Universal grade for all kinds of steel <30 HRC, non-ferrous metal and stainless steel.
- NC2032:**
 - Long tool life.
 - For all kinds of steel from 30~50 HRC, carbon steel, alloy steel, and cast iron.
- NC9031:**
 - Fully positive ground rake angle, very sharp edge for shallow engraving.
 - For non-ferrous metal such as aluminum, brass, copper, titanium, plastic and acrylic.



Angle	Parts No.	Coating	Grade	Re	Dimensions			W		T	
					L	S	Re	Wmin.	Wmax.	Tmin.	Tmax.
45°	NC2071	TiN	K20F		6.35 (0.250")	2.0 (0.079")	0.2 (0.008")	0.65 (0.026")		0.2 (0.008")	
	NC2032	TiAlN						0.65 (0.026")	2.1 (0.083")	0.2 (0.008")	2.0 (0.079")
	NC9031	TiN						0.45 (0.018")		0.05 (0.002")	

► Holder >>

- Carbide shank holders for high speed cutting.
- XL (100mm length) is only for Al, Al-alloy cutting, unbalanced <0.6gm.

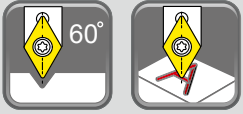


Angle	Parts No.	Shank	Ød	L	Screw	Key
45°	99619-V045-06	Steel		40 (1.575")		
	99619-V045-06L	Carbide	6 (0.236")	60 (2.362")	NS-22044 0.9Nm	NK-T7
	99619-V045-06XL	Carbide		100 (3.937")		
	99619-V045-08	Steel	8 (0.315")	60 (2.362")		

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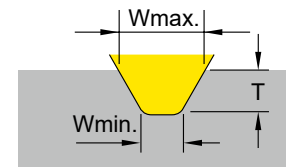
Engraving Tool

60° V060 Engraving Tool 60°



▶ Inserts >>

- NC2071:**
 - Strong edge on chip-breaker, best suited for min. DOC 0.2mm.
 - Universal grade for all kinds of steel <30HRC, non-ferrous metal and stainless steel.
- NC2032:**
 - Long tool life.
 - For all kinds of steel from 30~50 HRC, carbon steel, alloy steel, and cast iron.
- NC2035:**
 - ALDURA coating, reduces heat and tool wear.
 - For steel with heat treatment up to 56 HRC.
- NC9031:**
 - Fully positive ground rake angle very sharp edge for shallow engraving.
 - For non-ferrous metals such as aluminum, brass, copper, titanium, plastic and acrylic.
- NC9036:**
 - DLC coating, very sharp edge produces excellent surface finish.
 - For non ferrous metals such as aluminum, brass, copper, titanium, plastic and acrylic.



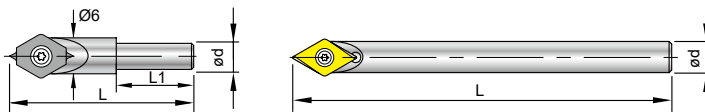
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Engraving Tool

Angle	Parts No.	Coating	Grade	Re	Dimensions			W		T	
					L	S	Re	Wmin.	Wmax.	Tmin.	Tmax.
60°	V06006T1W06	NC2071	TiN	K20F	6.35 (0.250")	2.0 (0.079")	0.2 (0.008")	0.65 (0.026")	2.7 (0.106")	0.2 (0.008")	2.0 (0.079")
		NC2032	TiAlN					0.65 (0.026")		0.2 (0.008")	
		NC2035	ALDURA					0.65 (0.026")		0.2 (0.008")	
		NC9031	TiN					0.45 (0.018")		0.05 (0.002")	
Angle	Parts No.	Coating	Grade	Re	Dimensions			W		T	
60°	V06006T1W03	NC2032	TiAlN	K20F	6.35 (0.250")	2.0 (0.079")	---	0.25 (0.01")	1.1 (0.043")	0.05 (0.002")	0.8 (0.031")
		NC9036	DLC					0.25 (0.01")		0.05 (0.002")	

▶ Holder >>

- Carbide shank holders for high speed cutting.
- XL (100mm length) is only for Al, Al-alloy cutting, unbalanced <0.6gm.



Angle	Parts No.	Shank	Ød	L	L1	Screw	Key
60°	99619-V060-04	Steel	4 (0.157")	30 (1.181")	12 (0.472")	NS-22044 0.9Nm	NK-T7
	99619-V060-06	Steel		40 (1.575")	---		
	99619-V060-06L	Carbide	6 (0.236")	60 (2.462")	---		
	99619-V060-06XL	Carbide		100 (3.937")	---		
	99619-V060-08	Steel	8 (0.315")	60 (2.462")	---		

N9MT080201W Engraving Tool 60° / 90°

60°
90°



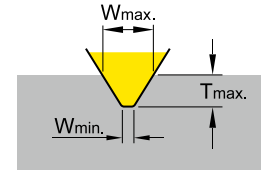
▶ Inserts >>

- No need to reset tool length after changing insert or cutting edge.
- The inserts can be used for small diameter spotting.
- Each insert has 4 cutting edges.

60-NC40: • Very positive angle for 60° engraving for all kind of unhardened steel and cast iron.

NC40: • Universal grade for all unhardened steel.

NC10: • Universal grade for non-ferrous metal and cast iron.

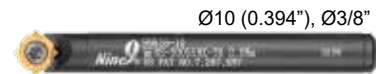
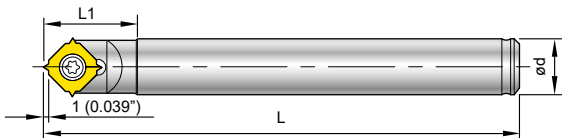


Angle	Parts No.		Coating	Grade	Dimensions	Wmin.	Wmax.	Tmax.
60°	N9MT080201W	60-NC40	TiN	K20F		0.2 (0.008")	1.1 (0.043")	0.8 (0.031")
90°		NC40	TiN	K20F		0.2 (0.008")	2.0 (0.079")	0.9 (0.035")
90°		NC10	TiAlN	K20F		0.2 (0.008")	2.0 (0.079")	0.9 (0.035")

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Engraving Tool

▶ Holder >>



Parts No.	Ød	L	L1	Screw	Key
99616-10	10 (0.394")	90 (3.543")	18 (0.709")	NS-30055 2.0 Nm	NK-T8
99616-3/8	3/8"	90 (3.543")			

▶ Cutting Data >>

(Tmax.: 0.0315")

Workpiece Material	S (r.p.m)	IPR (inch/rev.)	Depth of cut (inch)				Insert Grade
			1st	2nd	3rd	Finishing	
P Alloy steel	5000 ~ 20000	0.0003" ~ 0.0008"	0.012"	0.008"	0.008"	0.002"	60-NC40, NC40
K Cast iron							60-NC40, NC10
N Non-ferrous metal							NC10

Performance

▶ Comparison >>

Tool				
Cutting data		00-99619-V060-06 V06006T1W06-NC2071	Engraving tool	Ball nose end mill Radius 0.4 mm
Workpiece material Tool steel SKD 61 (JIS G 4404), Hardness: HRB92~93 (HB 200)				
Spindle speed	r.p.m.	10000	10000	10000
Feed rate	mm/min.	100	100	300
Cutting depth Ap		0.2 mm	0.2 mm	0.05 mm, 4 times to cut to 0.2 mm
Roughness of bottom Ra		0.36 μm	0.83 μm	0.46 μm
Change and resetting		No need	Need	Need
Tool life		Long	Short	Short

Measured result by Alicona IFM system

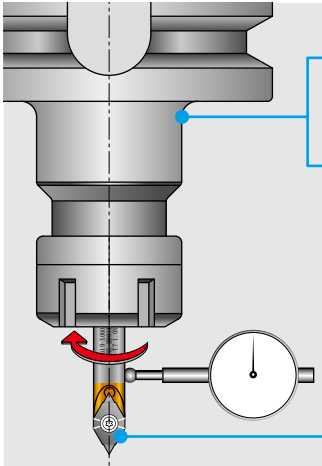


Tool		00-99619-V060-06 V06006T1W06-NC2071	00-99619-V060-06 V06006T1W06-NC2071	00-99619-V060-06 V06006T1W06-NC2035
Cutting data				
Workpiece material		P SKD 51	M SS	H SKD 61 (50HRC)
Spindle speed	r.p.m.	10000	10000	10000
Feed rate	mm/min.	300	300	100
Cutting depth Ap		0.1 mm	0.35 mm	0.2 mm
Change and resetting		No need	No need	No need
Tool life		24 min.(1440 sec.)	7.2 meters	3.5 meters

3

Engraving Tool

▶ Attention >>



- Recommended of tool holders**
High precision spring collet chucks, shrink fit chucks, hydraulic chuck.
- Pre-balance the tool holder**
minimum G6.3/10,000 r.p.m. is necessary.
- The downward feed rate of the Z-axis**
should be reduced to 50% of the table feed rate.
- Tool shank runout:**
below 0.01 mm.
- Torque screwdriver is recommended**
- Cutting fluid and cooling condition**

Emulsion / Oil

Steel	Stainless Steel
Titanium	Hardened Steel

Oil	Air
Non-Ferrous	Cast Iron

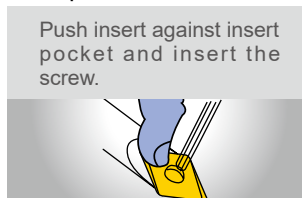
▶ Clamping the engraving insert

- Place and hold the insert in the insert pocket against the positioning side.

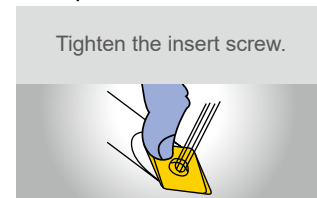
• Step-1



• Step-2





• Step-3



Cutting Data >> X060 Engraving



▶ X060A30W020R / X060A30R020

(Tmax. : 0.024")

Workpiece Material	S (r.p.m)	IPR (inch/rev.)		Depth of cut (inch)						Grade of Insert
		Radius Angled 	Radius 	1st	2nd	3rd	4th	5th ~	Finishing	
P Carbon steel	8000 ~ 40000	0.00004" ~ 0.00039"	0.00008" ~ 0.00059"	0.006"	0.004"	0.002"	0.002"	0.002"	0.0008"	NC2032
Alloy steel		0.00004" ~ 0.00024"	0.00008" ~ 0.00039"	0.006"	0.004"	0.002"	0.002"	0.001"	0.0008"	NC2032, NC2035
M Stainless steel		0.00004" ~ 0.00024"	0.00008" ~ 0.00039"	0.004"	0.002"	0.002"	0.001"	0.001"	0.0008"	NC2032
K Cast iron		0.00004" ~ 0.00024"	0.00008" ~ 0.00039"	0.006"	0.004"	0.002"	0.002"	0.001"	0.0008"	NC2032
N Non-ferrous metal		0.00004" ~ 0.00047"	0.00008" ~ 0.00079"	0.008"	0.004"	0.004"	0.002"	0.002"	0.0008"	XP9001
H Hardened steel < HRC56		0.00004" ~ 0.00020"	0.00008" ~ 0.00024"	0.004"	0.002"	0.001"	0.001"	0.0008"	0.0004"	NC2035



▶ X060A45W020R / X060A45R020

(Tmax. : 0.031")

Workpiece Material	S (r.p.m)	IPR (inch/rev.)		Depth of cut (inch)						Grade of Insert
		Radius Angled 	Radius 	1st	2nd	3rd	4th	5th ~	Finishing	
P Carbon steel	8000 ~ 40000	0.00008" ~ 0.00047"	0.00008" ~ 0.00059"	0.010"	0.006"	0.004"	0.002"	0.002"	0.001"	NC2032
Alloy steel		0.00008" ~ 0.00039"	0.00008" ~ 0.00039"	0.008"	0.004"	0.002"	0.002"	0.002"	0.001"	NC2032, NC2035
M Stainless steel		0.00008" ~ 0.00031"	0.00008" ~ 0.00039"	0.008"	0.004"	0.002"	0.002"	0.002"	0.001"	NC2032
K Cast iron		0.00008" ~ 0.00039"	0.00008" ~ 0.00039"	0.008"	0.004"	0.004"	0.002"	0.002"	0.001"	NC2032
N Non-ferrous metal		0.00008" ~ 0.00059"	0.00008" ~ 0.00079"	0.012"	0.008"	0.004"	0.004"	0.002"	0.001"	XP9001
H Hardened steel < HRC56		0.00008" ~ 0.00024"	0.00008" ~ 0.00024"	0.006"	0.004"	0.002"	0.002"	0.001"	0.0008"	NC2035

▶ X060A60W020R / X060A60R020

(Tmax. : 0.039")

Workpiece Material	S (r.p.m)	IPR (inch/rev.)		Depth of cut (inch)						Grade of Insert
		Radius Angled 	Radius 	1st	2nd	3rd	4th	5th ~	Finishing	
P Carbon steel	8000 ~ 40000	0.00008" ~ 0.00047"	0.00008" ~ 0.00059"	0.012"	0.008"	0.004"	0.004"	0.002"	0.001"	NC2032
Alloy steel		0.00008" ~ 0.00039"	0.00008" ~ 0.00039"	0.012"	0.004"	0.004"	0.002"	0.002"	0.001"	NC2032, NC2035
M Stainless steel		0.00008" ~ 0.00031"	0.00008" ~ 0.00039"	0.008"	0.004"	0.004"	0.002"	0.002"	0.001"	NC2032
K Cast iron		0.00008" ~ 0.00039"	0.00008" ~ 0.00039"	0.012"	0.004"	0.004"	0.002"	0.002"	0.001"	NC2032
N Non-ferrous metal		0.00008" ~ 0.00059"	0.00008" ~ 0.00079"	0.012"	0.008"	0.004"	0.004"	0.002"	0.001"	XP9001
H Hardened steel < HRC56		0.00008" ~ 0.00024"	0.00008" ~ 0.00024"	0.008"	0.004"	0.002"	0.002"	0.001"	0.0008"	NC2035

▶ X060A90W020R

(Tmax. : 0.039")

Workpiece Material	S (r.p.m)	IPR (inch/rev.)	Depth of cut (inch)						Grade of Insert
			1st	2nd	3rd	4th	5th ~	Finishing	
P Carbon steel	8000 ~ 40000	0.00008" ~ 0.00059"	0.012"	0.008"	0.004"	0.004"	0.002"	0.001"	NC2032
Alloy steel		0.00008" ~ 0.00039"	0.012"	0.004"	0.004"	0.002"	0.002"	0.001"	NC2032, NC2035
M Stainless steel		0.00008" ~ 0.00039"	0.008"	0.004"	0.004"	0.002"	0.002"	0.001"	NC2032
K Cast iron		0.00008" ~ 0.00039"	0.012"	0.004"	0.004"	0.002"	0.002"	0.001"	NC2032
N Non-ferrous metal		0.00008" ~ 0.00079"	0.016"	0.012"	0.008"	0.004"	0.002"	0.001"	XP9001
H Hardened steel < HRC56		0.00008" ~ 0.00024"	0.008"	0.004"	0.002"	0.002"	0.001"	0.0008"	NC2035

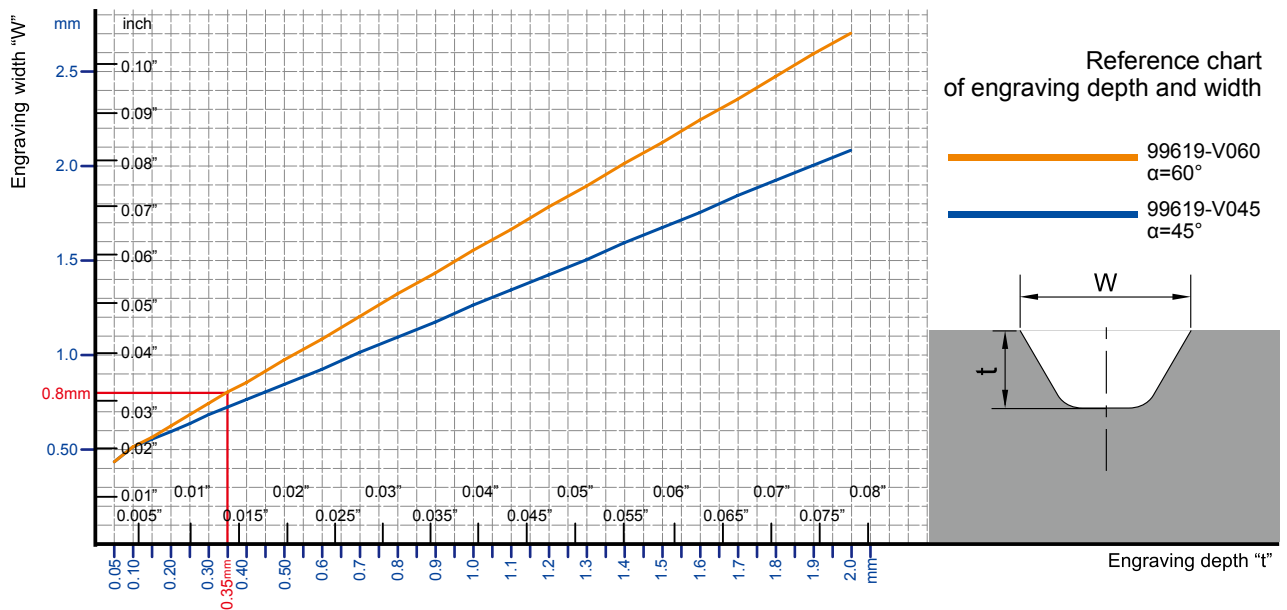
3

Engraving Tool

Cutting Data >> V045/V060 Engraving

- To use the engraving chart, select your engraving width (w) on the vertical axis. Select your engraving insert angle (45° or 60°), and follow the horizontal line from the (w) axis to the intersection with the insert angle.
- Follow the vertical line from this intersection point to the engraving depth (t) axis to determine the engraving depth.

▶ V045/V060 T1W06



	Work Material	S (r.p.m)	IPR (inch/rev.)	Grade of Insert
P	Carbon steel	5000~40000	0.0003~0.0020	NC2071,NC2032
	Alloy steel	5000~40000	0.0003~0.0012	NC2032,NC2071
M	Stainless steel	5000~40000	0.0003~0.0020	NC2071,NC9031
K	Cast iron	5000~40000	0.0003~0.0012	NC2032
N	Non-ferrous metal	5000~40000	0.0003~0.0031	NC2071,NC9031
H	Hardened steel < HRC56	6000~35000	0.0001~0.0004	NC2035

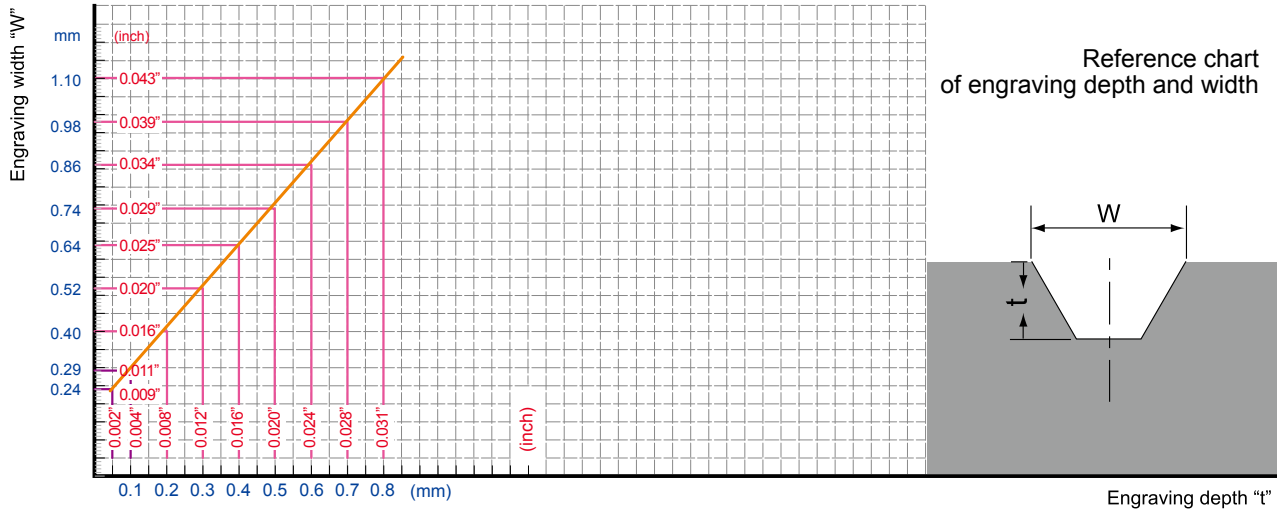
(Tmax.:0.079")

Material	Ap	(Tmax.:0.079")							
		1st	2nd	3rd	4th	5th	6th	~	Fine finishing
P	Carbon steel	0.031"	0.024"	0.012"	0.008"	0.004"	~	~	0.002"
	Alloy steel	0.020"	0.016"	0.012"	0.012"	0.008"	0.008"	0.004"	0.002"
M	Stainless steel	0.020"	0.016"	0.012"	0.012"	0.008"	0.008"	0.004"	0.002"
K	Cast iron	0.031"	0.024"	0.012"	0.008"	0.004"	~	~	0.002"
N	Non-ferrous metal	0.039"	0.031"	0.008"	~	~	~	~	0.002"
H	Hardened steel < HRC56	0.008"	0.008"	0.006"	0.006"	0.004"	0.004"	0.004"	0.002"

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Engraving Tool

▶ V060 T1W03



	Workpiece Material	S (r.p.m)	IPR (inch/rev.)	Grade of Insert
P	Carbon steel	8000 ~ 40000	0.0002 ~ 0.0006	NC2032
	Alloy steel	6000 ~ 35000	0.0002 ~ 0.0004	NC2032
M	Stainless steel	8000 ~ 35000	0.0001 ~ 0.0004	NC9036
K	Cast iron	6000 ~ 35000	0.0002 ~ 0.0006	NC2032
N	Non-ferrous metal	8000 ~ 40000	0.0002 ~ 0.0006	NC9036
S	Ti, Ti-alloy	6000 ~ 15000	0.0001 ~ 0.0004	NC9036

(Tmax.:0.0315")

Material	Ap	1st	2nd	3rd	4th	5th	~	Fine finishing
P	Carbon steel	0.0118"	0.0080"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
	Alloy steel	0.0118"	0.0040"	0.0040"	0.0020"	0.0020"	0.0020"	0.0012
M	Stainless steel	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
K	Cast iron	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
N	Non-ferrous metal	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
S	Ti, Ti-alloy	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012

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Engraving Tool