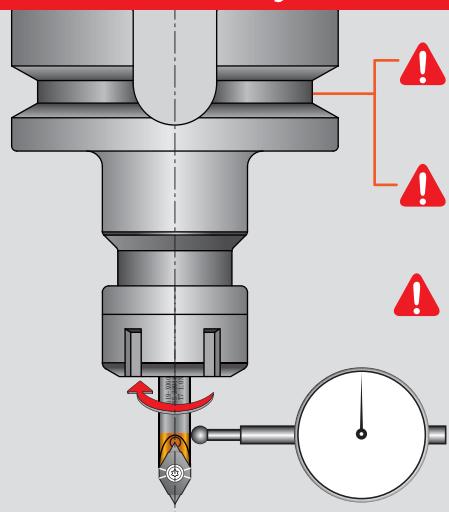




Engraving Tools

Before you start, please pay attention the following conditions



! 1 Recommended of tool holders

High precision spring collet chucks,
shrink fit chucks, hydraulic chuck.

! 2 Pre-balance the tool holder

minimum G6.3/10,000 r.p.m. is necessary.

**! 3 The downward feed rate
of the Z-axis**

should be reduced to 50%
of the table feed rate.

**! 4 Tool shank runout:
below 0.01 mm.**

**! 5 Cutting fluid and
cooling condition**

Emulsion / Oil



P Steel

M Stainless Steel

S Titanium

H Hardened Steel

Oil



N Non-Ferrous

Air



K Cast Iron

X060 series

▣ X060A30W020R / X060A30R020 (Tmax.: 0.6 mm)

Work Material	S (r.p.m)	f (mm/rev.)		Insert Grade	Depth of cut (mm)						
		Radius Angled X060A30W020R	Radius X060A30R020		1st	2nd	3rd	4th	5th	~	Finishing
P	8000 ~ 40000	Carbon steel C < 0.3%	0.001 ~ 0.010	NC2032	0.2	0.1	0.05	0.05	0.05	0.03	0.02
		Carbon steel C > 0.3%	0.001 ~ 0.008	NC2032	0.15	0.1	0.05	0.05	0.05	0.03	0.02
		Alloy steel	0.001 ~ 0.006	NC2032, NC2035	0.15	0.1	0.05	0.05	0.03	0.03	0.02
		Stainless Steel	0.001 ~ 0.006	NC2032	0.1	0.05	0.05	0.03	0.03	0.03	0.02
		Cast iron	0.001 ~ 0.006	NC2032	0.15	0.1	0.05	0.05	0.03	0.03	0.02
		Aluminum	0.001 ~ 0.012	XP9001	0.2	0.1	0.1	0.05	0.05	0.05	0.02
		Copper, Brass	0.001 ~ 0.012	XP9001	0.2	0.1	0.1	0.05	0.05	0.05	0.02
		Hardened Steel Up to 56 HRC	0.001 ~ 0.005	NC2035	0.1	0.05	0.03	0.03	0.02	0.02	0.01

▣ X060A45W020R / X060A45R020 (Tmax.: 0.8 mm)

Work Material	S (r.p.m)	f (mm/rev.)		Insert Grade	Depth of cut (mm)						
		Radius Angled X060A45W020R	Radius X060A45R020		1st	2nd	3rd	4th	5th	~	Finishing
P	8000 ~ 40000	Carbon steel C < 0.3%	0.002 ~ 0.012	NC2032	0.3	0.2	0.1	0.05	0.05	0.05	0.03
		Carbon steel C > 0.3%	0.002 ~ 0.010	NC2032	0.25	0.15	0.1	0.05	0.05	0.05	0.03
		Alloy steel	0.002 ~ 0.010	NC2032, NC2035	0.2	0.1	0.05	0.05	0.05	0.05	0.03
		Stainless Steel	0.002 ~ 0.008	NC2032	0.2	0.1	0.05	0.05	0.05	0.05	0.03
		Cast iron	0.002 ~ 0.010	NC2032	0.2	0.1	0.1	0.05	0.05	0.05	0.03
		Aluminum	0.002 ~ 0.015	XP9001	0.3	0.2	0.1	0.1	0.05	0.05	0.03
		Copper, Brass	0.002 ~ 0.015	XP9001	0.3	0.2	0.1	0.1	0.05	0.05	0.03
		Hardened Steel Up to 56 HRC	0.002 ~ 0.006	NC2035	0.15	0.1	0.05	0.05	0.03	0.03	0.02

▣ X060A60W020R / X060A60R020 (Tmax.: 1 mm)

Work Material	S (r.p.m)	f (mm/rev.)		Insert Grade	Depth of cut (mm)						
		Radius Angled X060A60W020R	Radius X060A60R020		1st	2nd	3rd	4th	5th	~	Finishing
P	8000 ~ 40000	Carbon steel C < 0.3%	0.002 ~ 0.012	NC2032	0.3	0.2	0.1	0.1	0.05	0.05	0.03
		Carbon steel C > 0.3%	0.002 ~ 0.010	NC2032	0.3	0.2	0.1	0.1	0.05	0.05	0.03
		Alloy steel	0.002 ~ 0.010	NC2032, NC2035	0.3	0.1	0.1	0.05	0.05	0.05	0.03
		Stainless Steel	0.002 ~ 0.008	NC2032	0.2	0.1	0.1	0.05	0.05	0.05	0.03
		Cast iron	0.002 ~ 0.010	NC2032	0.3	0.1	0.1	0.05	0.05	0.05	0.03
		Aluminum	0.002 ~ 0.015	XP9001	0.3	0.2	0.1	0.1	0.05	0.05	0.03
		Copper, Brass	0.002 ~ 0.015	XP9001	0.3	0.2	0.1	0.1	0.05	0.05	0.03
		Hardened Steel Up to 56 HRC	0.002 ~ 0.006	NC2035	0.2	0.1	0.05	0.05	0.03	0.03	0.02

V045 / V060 series



■ V04506T1W06 / V06006T1W06 (Tmax.: 2 mm)

Work Material	S (r.p.m)	f (mm/rev.)	Insert Grade	Depth of cut (mm)							
				1st	2nd	3rd	4th	5th	6th	—	Finishing
P Carbon steel	5000 ~ 40000	0.008 ~ 0.05	NC2071, NC2032	0.8	0.6	0.3	0.2	0.1	—	—	0.05
M Alloy steel	5000 ~ 40000	0.008 ~ 0.03	NC2032, NC2071	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.05
M Stainless Steel	5000 ~ 40000	0.008 ~ 0.05	NC2071, NC9031	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.05
K Cast iron	5000 ~ 40000	0.008 ~ 0.03	NC2032	0.8	0.6	0.3	0.2	0.1	—	—	0.05
N Aluminum ≥ Non-Ferrous Metal	5000 ~ 40000	0.008 ~ 0.08	NC2071, NC9031	1.0	0.8	0.2	—	—	—	—	0.05
H Hardened steel up to 56 HRC	6000 ~ 35000	0.003 ~ 0.01	NC2035	0.2	0.2	0.15	0.15	0.1	0.1	0.1	0.05

■ V06006T1W03 (Tmax.: 0.8 mm)



Work Material	S (r.p.m)	f (mm/rev.)	Insert Grade	Depth of cut (mm)						
				1st	2nd	3rd	4th	5th	—	Finishing
P Carbon steel C < 0.3%	8000 ~ 40000	0.005 ~ 0.010	NC2032	0.3	0.2	0.1	0.1	0.05	0.05	0.03
P Carbon steel C > 0.3%	8000 ~ 40000	0.005 ~ 0.015	NC2032	0.3	0.2	0.1	0.1	0.05	0.05	0.03
M Alloy steel	6000 ~ 35000	0.005 ~ 0.010	NC2032	0.3	0.1	0.1	0.05	0.05	0.05	0.03
M Stainless Steel	8000 ~ 35000	0.003 ~ 0.010	NC9036	0.2	0.1	0.1	0.1	0.05	0.05	0.03
K Cast iron	6000 ~ 35000	0.005 ~ 0.015	NC2032	0.2	0.1	0.1	0.1	0.05	0.05	0.03
N Aluminum	8000 ~ 40000	0.005 ~ 0.015	NC9036	0.2	0.1	0.1	0.1	0.05	0.05	0.03
C Copper, Brass	8000 ~ 40000	0.005 ~ 0.010	NC9036	0.2	0.1	0.1	0.1	0.05	0.05	0.03
S Titanium	6000 ~ 15000	0.003 ~ 0.010	NC9036	0.2	0.1	0.1	0.1	0.05	0.05	0.03

W060 series

■ W06004S101, W06004S102, W06004S103

(Tmax.: 0.2 mm) (Tmax.: 0.4 mm) (Tmax.: 0.6 mm)



N9MT series

■ N9MT080201W (Tmax.: 0.8 mm)



Work Material	S (r.p.m)	f (mm/rev.)	Insert Grade	Depth of cut (mm)			
				1st	2nd	3rd	Finishing
P All unhardened steel	5000 ~ 20000	0.008 ~ 0.02	60-NC40, NC40	0.3	0.2	0.2	0.05
K Cast iron	5000 ~ 20000	0.008 ~ 0.02	60-NC40, NC10	0.3	0.2	0.2	0.05
N Non-Ferrous Metal	5000 ~ 20000	0.008 ~ 0.02	NC10	0.3	0.2	0.2	0.05