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AP Series

Wire Cut EDM

The Best Solution of CNC Wire EDM Technology



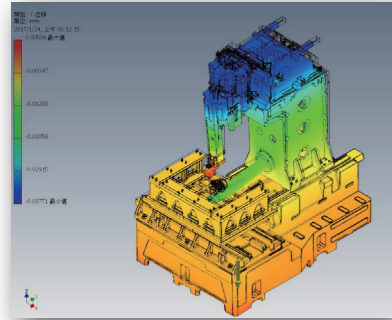
Environmental Requirements

Power Source	AC220V / AC380±5% :3 Phases 50/60Hz±1Hz
Temperature	20±1°C or 25±1°C ; less than 75%RH
Environment	<ol style="list-style-type: none"> 1.The machine should not be placed near punching machine,drilling machine or any interfering sources. 2.The machine should not be placed near heat treatment or electroplate systems. 3.The machine be placed in an airtight room to keep dust out. 4.Before machine positioning, pay attention to machine movement during operation and the space needed for maintenance. 5.Solid foundation of horizontal error should be less than 20µm.
Earth construction	Earth resistance below 10Ω: separate the earth terminal with other machines.
Pneumatic pressure	6 kg/cm ² (Applicable for machine with AWT system)

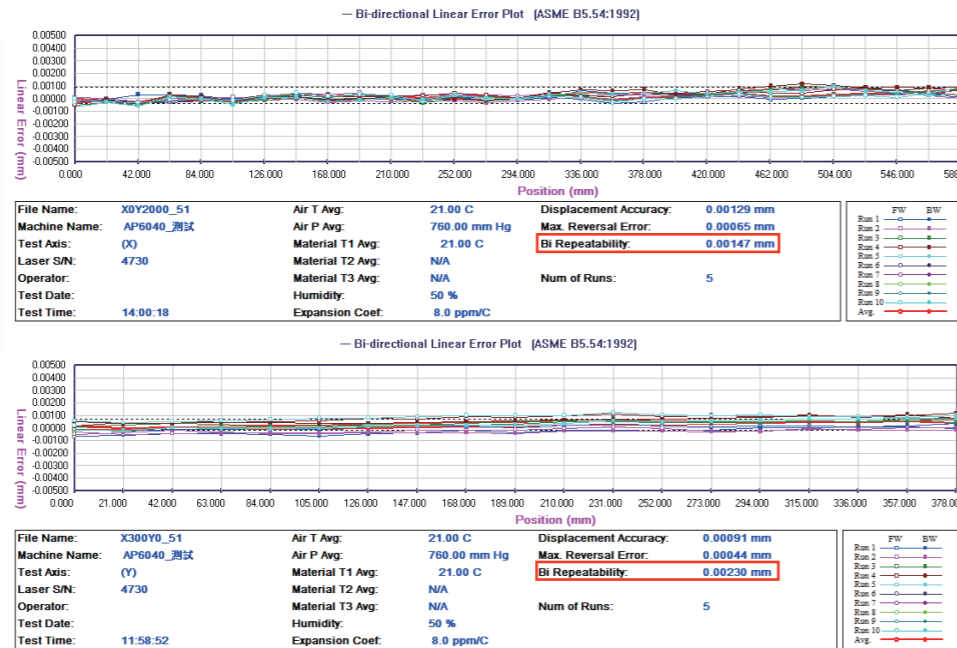
*All the specifications are subject to change without prior notice.

High-Rigidity Structure

AP series casting has compound table design by Y axis column moving. The center of gravity is always located between 2 linear guideways of X axis table. X and Y axes are independent without accumulation error for less deformation by FEA (Finite Element Analysis). Improved maximum loading weight is up to 1000kgs. The Bi-repeatability is less than 2.5µm after 5 times laser calibration.



Machine structure was designed via Finite Element Analysis (FEA) with high rigidity.



Five times laser measurements

Windows CE Controller



AccuteX controller is 100% self-developed by core-technologies of R&D team. We can provide the best support in any modifications. AccuteX controller is based on Window CE system. It features "Precise Motion Control" with rapid servo response. Also, Windows CE system is virus free environment to assure system stability.

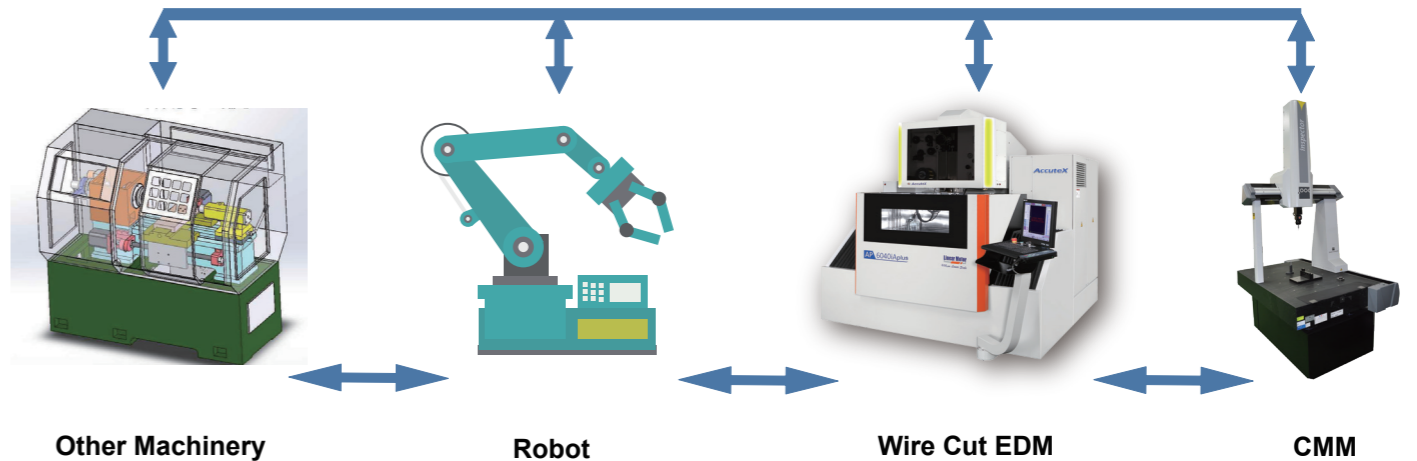
Auto Wire Threading (*Optional)



- >"AC servo tension wheel", tension control during cutting, featuring reverse tension while wire breaks.
- >"Wire End Needle-Shaping", while the wire is cut off by electricity, the reverse tension and annealing heat treatment are applied to strengthening the wire at the same time.
- >"Waste Wire Auto Removing Device " by air blow system to remove waste wire to the collection cabinet, quick and easily.



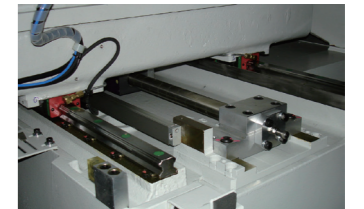
Industry 4.0- Intelligent Manufacturing Integration System



AccuteX machine is capable with industry 4.0 who has M2M (machine to machine) protocol to collaborate with Robots and other machines. Flexible Real-time production can be made by Intelligent Manufacturing Integration System to meet full-automation demand.

Linear Motor

New generation shaft-type linear motor is self-developed by AccuteX. It features with closed loop control by 0.1µm resolution linear scale (0.05µm optional) and backlash free to keep accuracy. Rapid servo response can improve cutting efficiency up to 10%. AccuteX linear motor has excellent lower power consumption to keep constant working temperature.

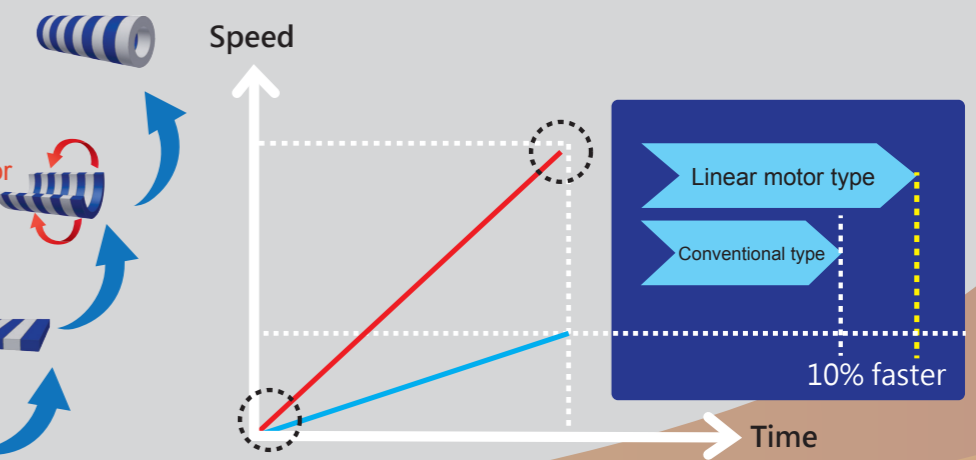


Improving Cutting Performance
Rapid servo response prevents wire breaking and increases cutting speed.

New Generation shaft Linear Motor
Lower maintenance cost.
Excellent low power consumption characteristics.

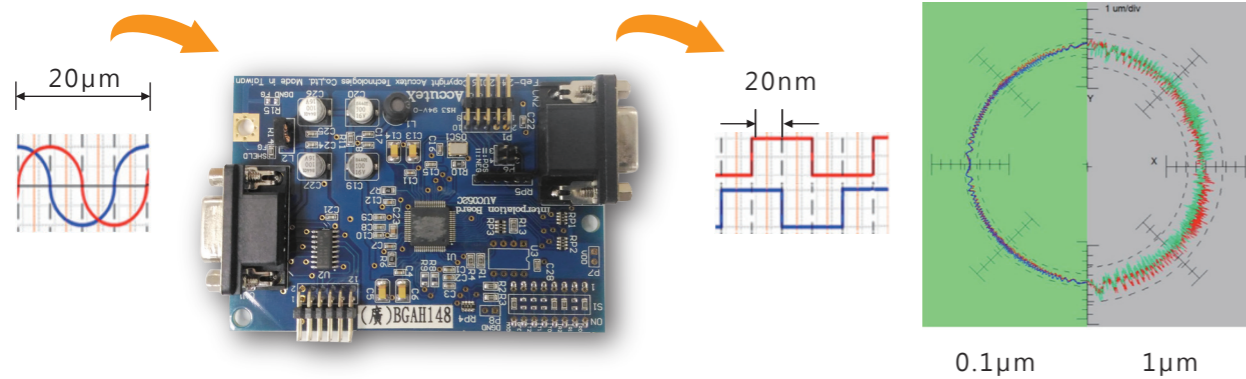
Flat Type Linear Motor

Rotary Motor



Ultra Resolution Signal Processor

Linear scale interpolation board with ultra resolution to achieve smoother velocity and stabilize position control. Standard resolution is $0.1\mu\text{m}$ ($0.05\mu\text{m}$ optional)

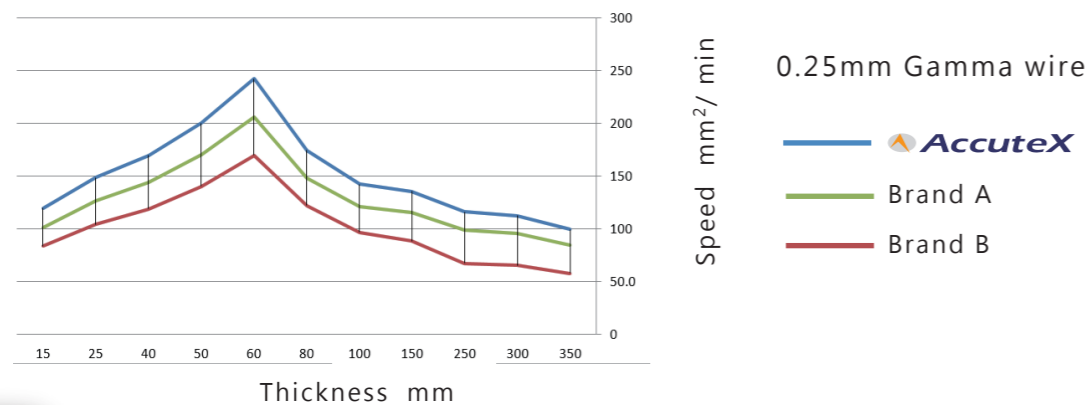


Standard scale can narrow down to 20nm

Different linear-scale resolution

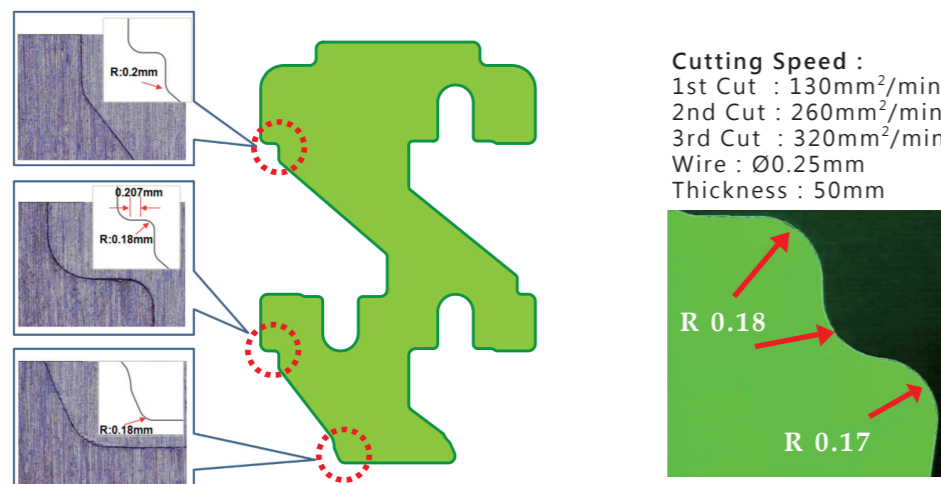
Cutting Efficiency Comparison

AccuteX has simplified the generator and electric circuits to eliminate unnecessary power loss and improve the cutting efficiency. Speed comparison table with other brands in different thickness of workpieces.



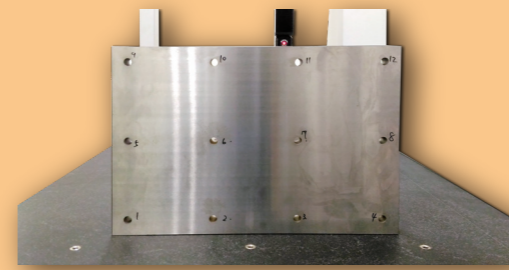
Corner Control Function

According to different wire diameters, corner angles, arc radius and thicknesses, AccuteX controller optimizes parameters for the best cutting efficiency with high accuracy. Especially on the small path and continuous corners, machines can meet the corner accuracy demand.



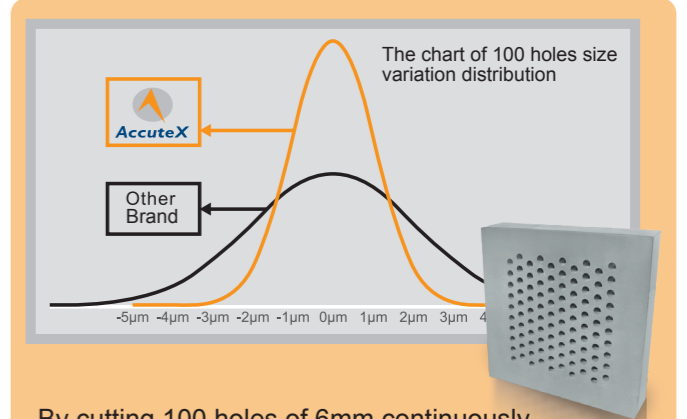
3 The stamping mold (Punch mold is 50mm and die mold is 30mm) has fine $3\mu\text{m}$ tolerance.

High Cutting Accuracy Performance



The best pitch accuracy is less than $\pm 3\mu\text{m}$ in 12 holes mold cutting (size: $400 \times 300 \times 30\text{mm}$). The working conditions are by SKD11 material after 3 cuts under temperature and environment control.

(*)The cutting conditions must follow AccuteX's provisions.
(*)Performed by AP-6040A⁺

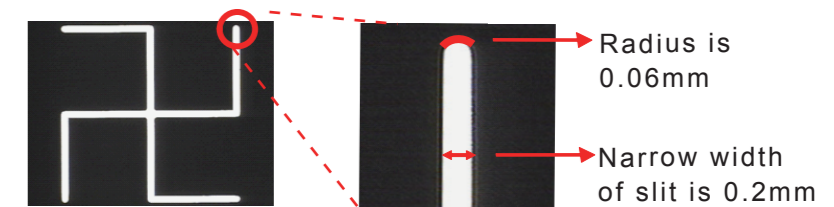


By cutting 100 holes of 6mm continuously, 95.45% of repeatability is within $\pm 1.5\mu\text{m}$.

0.05~0.1mm Fine Wire Application (*Optional)

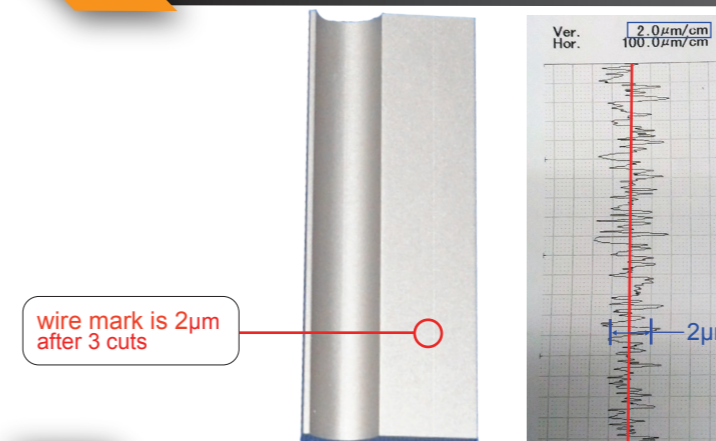


0.07mm Fine wire application is 90% successfully threading under 30mm Z axis height which is suitable for micro-machining applications.



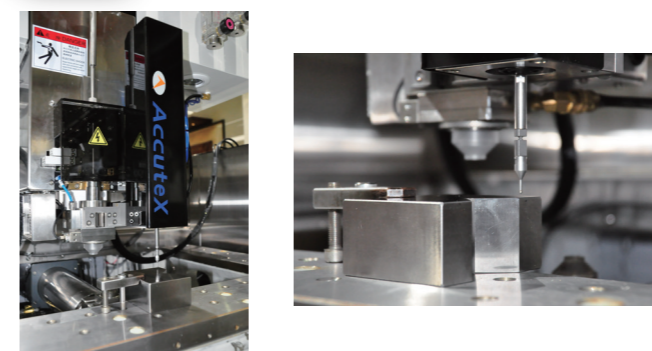
Spinneret projection mold was cut by 0.07mm wire. The average width of slit is 0.2mm after 5 cuts. The smallest radius is 0.06mm .

New Lead-In / Lead-Out Control



New generation of Lead-In / Lead-Out function is available for Tungsten Carbide. The wire mark is $2\mu\text{m}$ after 3 cuts by 40mm thickness which improving mold quality and saving second time polishing hours.

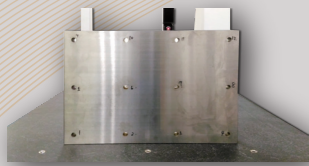
Probing Measuring System (*Optional)



"Probing Measuring System" detects feature of Non-Leveling workpiece. It compensates error by integrated 3rd party CAD/CAM software and improve workpiece accuracy. It's available for mass-production with automation application.

Cutting Samples

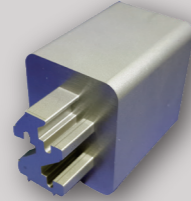
Pitch Accuracy



- The best pitch accuracy is $< \pm 3\mu\text{m}$ by SKD11 mold (size: 400x300x30mm) with 12 holes cutting.
- Performed by AP-6040A⁺ model

Material	SKD11
Thickness	30mm
Wire size	0.25mm
Cut	3

Continuous Corner



- Keeping equal tolerance in continuous corner.
- Continuous radius is 0.18mm Short path is 0.207mm

Material	SKD11
Thickness	Punch 50mm Die 30mm
Wire size	0.25mm
Cut	3

Fine Finish Ra0.06 μm (Optional MST II Power Module)



- The best fine finish: Ra is 0.06 μm ; (Rz is 0.65~0.75 μm).
- Average fine finish in 4 sides of circle die.

Material	Tungsten Carbide
Thickness	30mm
Wire size	0.2mm
Cut	9

Machine Specifications

	AP-4030	AP-6040
Max. Workpiece Size L x W x H (mm)	800 x 560 x 245	1050 x 775 x 345
Max. Workpiece Weight (kg)	800	1000
X/Y Stroke (mm)	400 x 300	600 x 400
U/V Stroke (mm)	100 x 100	160 x 160
Z Stroke (mm)	250	350
Max. Cutting Taper (mm)	$\pm 21^\circ$ / H100mm	$\pm 32^\circ$ / H100mm
Max. Wire Spool Weight (kg)	10	16
Footprint (mm)W x D x H	2150 x 2600 x 2250	2312 x 2795 x 2371
Water System Capacity (L)	600	1000
Machine Weight (kg)	3200	4000

(*) "A" stands for AWT optional.

(*) "+" stands for machine with 0.05 μm linear scale optional function.

Controller Functions

Backlash compensation	Pitch compensation	Program management	Program edit
Anti-Collision	Cutting path display	Linear/Circular interpolation	Auto corner
N code jump	Sub program	Multi-blocks skip	Corner control function
MDI function	Taper cutting	Different shape interpolation	Optional stop
Single block	Mirror	Rotation	Axis exchange
Short back	Constant / Servo feed	2 nd Soft limit	Parallel compensation
Auto position (edge, center)	Dry run	Block stop	Reference point setting
Reference point return	Start point return Retrace to start point	Auto power recovery	Diagnosis
Cutting log	Maintenance memo	Auto compensation for wire consumption	Lead-in / Lead-Out Control

Standard Accessories

- SD Master
- Touch Screen
- XY Axes Linear Motor System
- 0.1 μm Resolution Linear Scale
- Anti-Collision on XYUV Axes
- Safety Door Interlock
- Automatic Sliding door
- Upper / Lower Flushing Nozzle
- Diamond Guide
- Conductor Plate
- Brass Wire
- Ion Exchange Resin
- Ion Resin Tank
- Paper Filter
- Waste Wire Bin
- Vertical Alignment Jig
- Diamond Guide Remove Jig
- Tools and Clampers
- Machine Status Indicator
- Tool Box

Controller Specifications

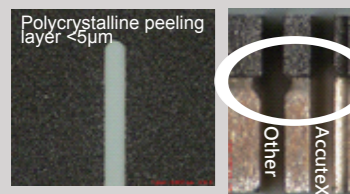
Controller System	Windows CE
Control Device	64-bit Industrial PC
Memory Device	$\geq 1\text{GB}$ CF Card
Screen Display Device	17" Color TFT Touch Screen
Data Input	Keyboard, Mouse Pointer, RS-232, USB, Ethernet, FTP
No. of Control Axes	5 Axes/ 6 Axes (Option on W Axis)
Simultaneous Axes	4 Axes/ 5 Axes (Option on W Axis)
Min. Command Unit	0.0001mm
Max. Command Range	$\pm 9999.9999\text{mm}$
Command Type	mm/inch
Cutting data Memory	99999 Sets
Ignition Power Supply	32 Steps · 53V~138V
On time	24 Steps
Off time	43 Steps
Discharge Mode	Rough Cut / Skim Cut / Fine Cut

Optional Accessories

- Transformer
- Auto Voltage Stabilizer
- Water Chiller
- MST II Power Module
- PCD / Graphite Power Module
- Rotary Table Package (W axis)
- 0.05mm~0.1mm Fine Wire Application
- 0.05 μm Resolution Linear Scale
- Auto Wire Threading (AWT)
- High Pressure Water Jet Threading
- 45Kg Wire Jumbo Feeder
- Remote Master
- GSM Messenger
- Anti-Collision on Z-Axis
- Industry 4.0 Intelligent Manufacturing Integration System
- Probing Measuring System

PCD Application

(Optional PCD / Graphite Power)



- Polycrystalline peeling layer is $< 5\mu\text{m}$ by optional PCD power with less grinding hours.
- Clear fit between PCD and carbide connection.

Material	PCD
Thickness	1mm
Wire size	0.2mm
Cut	1

Super Fine Spinneret

(Optional Wire 0.05~0.1mm)



- Narrow width of slit is 0.2mm
- Radius is 0.06mm

Material	Tungsten Carbide
Thickness	5mm
Wire size	0.07mm
Cut	5

Helical Gear Cutting

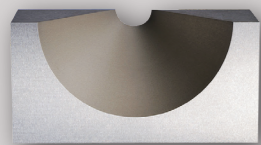
(Optional Rotary Table)



- Vertical type for rotary table application
- Gear diameter is 380mm

Material	Steel
Thickness	25mm
Wire size	0.25mm
Cut	2

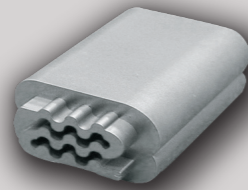
35° Wide Taper Cutting



- Plastic Injection Application
- Single side taper is 35°

Material	SKD11
Thickness	40mm
Wire size	0.25mm
Fine finish	Ra $< 0.7\mu\text{m}$
Cut	3

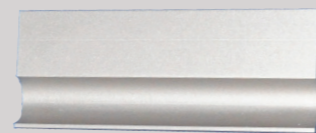
High Slenderness Ratio
& Complex Profile Assembling Parts



- Stamping Mold Application
- Maximum tolerance is less than 5 μm /80mm

Material	SKD11
Thickness	80mm
Wire size	0.2mm
Cut	5

Lead-In / Lead-Out



- 2 μm wire mark on thickness 40mm tungsten carbide after 3 cuts.
- Only turn on the function without any cutting path modifications.

Material	Tungsten Carbide
Thickness	40mm
Wire size	0.25mm
Cut	3