Value-Added NCT Tools

～Introduction of Special Purposed Tools for Process Integration～

Slotting Tool

High Speed Marking Tool

Endless Forming Tool

Work Chute Tool

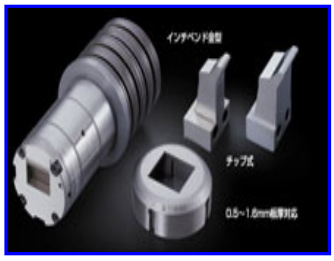
Deburring Tool

FP Tool

BK Burring Tool

Contouring Tool

Inch Bend Tool



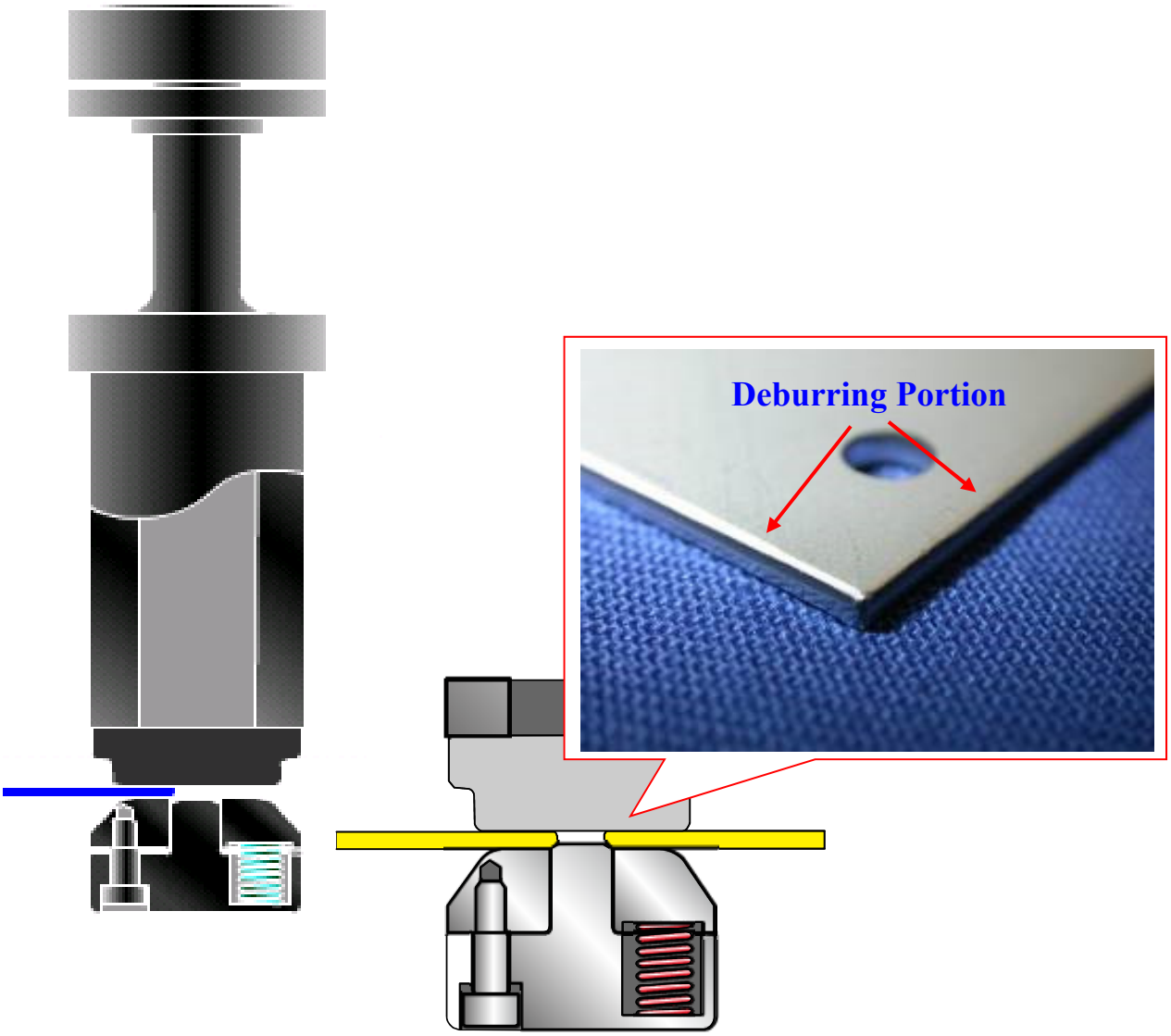
MPT Tapping Tool

AMADA

～ Index ～

1. Deburring Work Reduction by EM machine

Deburring Tool



Deburring Work Issues

- It takes man-hours and costs due to hand work.
- Hand work causes unstable quality.



Some man-hours are taken for secondary works such as deburring or tapping after NCT processing.

Solution

Most of secondary works can be done by NCT machine.

▪Deburring work can be reduced by the tool using together with EM machine with high hit rate & high productivity.

NCT Process Integration!

Deburring work is integrated into blanking process!!


1-②. Introduction Effects of Deburring Tool

Case Example ／ Product 100pcs

Reference Data

PEGA

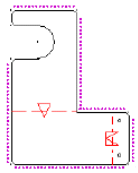
Blanking 72 min 55 sec

Deburring (hand work) 18 min 04 sec

EM

Blanking+Deburring 36 min 40 sec

59.7% Time-saving



Deburring Portion

※Reference data is EM.

※ The values will vary by products.
※ Deburring work is not eliminated completely.
※ Deburring time of PEGA refers to Amada data (sander usage).

Customer's Voice

▪Deburring handwork of the notched or special shaped corner was difficult, but we could perform it uniformly by the deburring tool!

▪This tool contributed to reduce man-hours by integrating deburring works into the blanking process. Therefore, we could allocate labor to the bottleneck process!

▪A large heavy blanked sheet needs to be turned over for deburring, but now we do not need to do it by the deburring process integration.

Features

1.Available for straight line, radius, square hole, and round hole etc!

Deburring tool compresses burrs while tracing the blanking line.

Square shaped deburring tool, which is same as punching size, can work horizontally and vertically by using single station.

2.Deburring time reduction by the machine with high hit rate

The deburring work is performed by EM machine with high productivity, so secondary work is reduced.

Deburring Tool reduces a great amount of manpower for deburring.

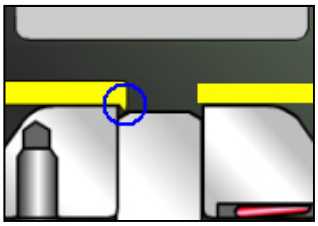
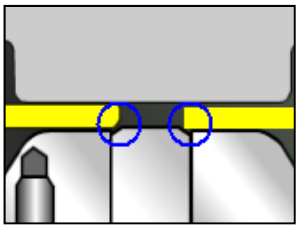
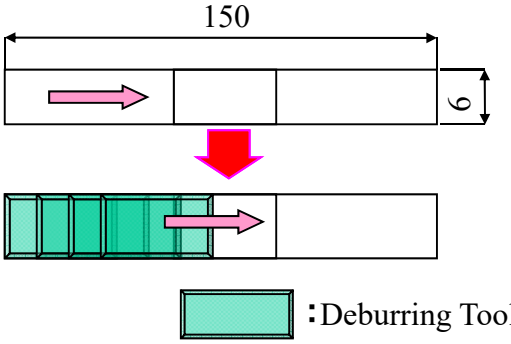
Specification

(mm)

Tool Type	NCT Long
Tool Size	Ast:1/2",Bst:1-1/4"
Referece Punch Size	Ast:1/2" ⇒ φ2 , SQ5 Bst:1-1/4" ⇒ SQ10 , RE5×20
Thickness	0.5mm ～ 3.2mm (Adjustable)
Material	Mild Steel, Stainless Steel, Aluminum
Deburring Amount	Approx. C0.2

SQ: Square RE: Rectangle

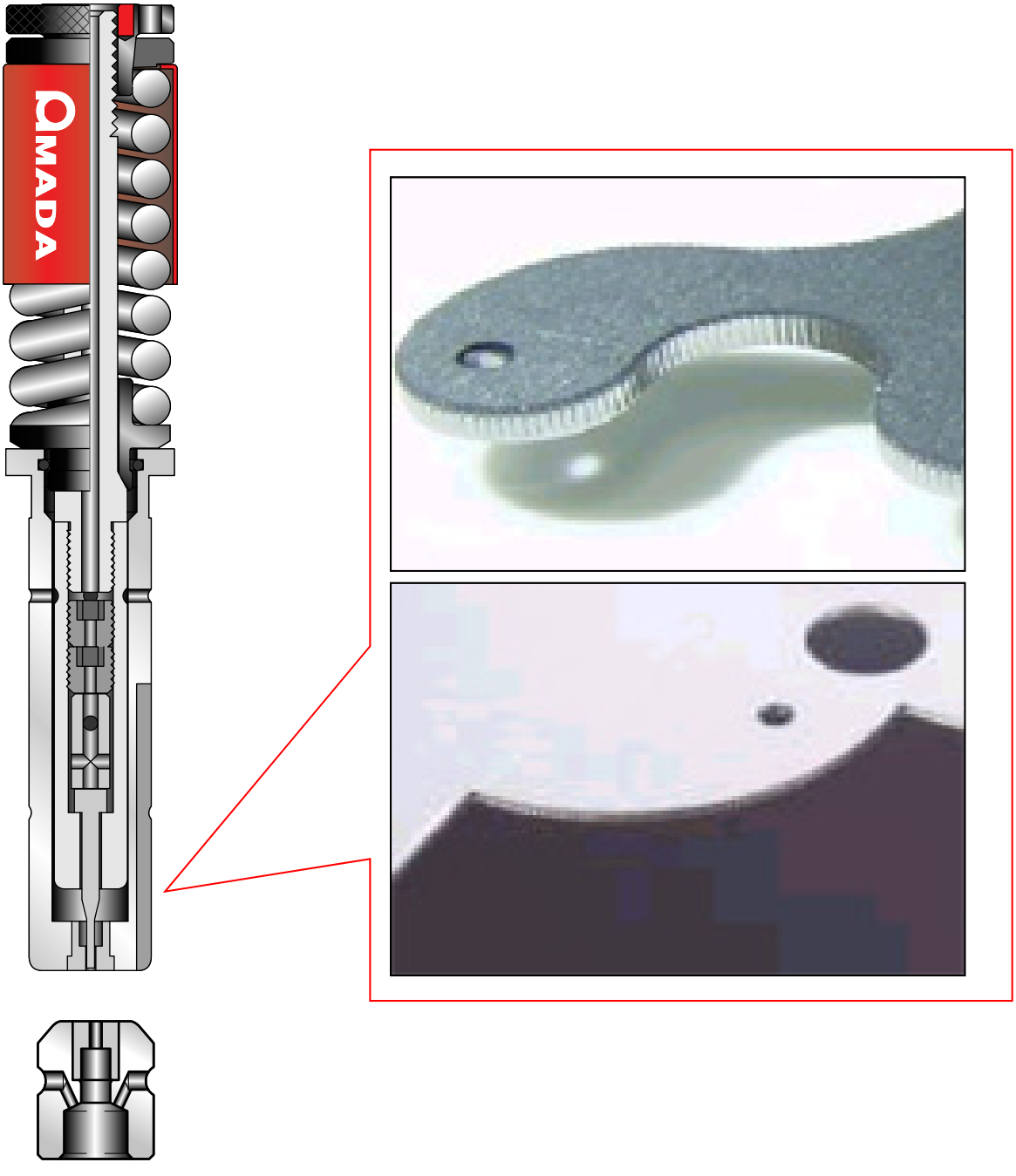
Bst:1-1/4"
SQ10Air-blow

Deburring Mechanism	Deburring Operation Program
 Fig.1 Before  Fing.2 After	Deburring tool traces the blanking line. (Auto allocation by AP100) 
Die tip has chamfered edge. The burrs on the rear surface were pressed by it. This tool is designed to debur after nibbling by desired shaped tools (SQ/RE). As shown Fig.2, the main point is that the die tip presses on material equally.	

2. Free Forming

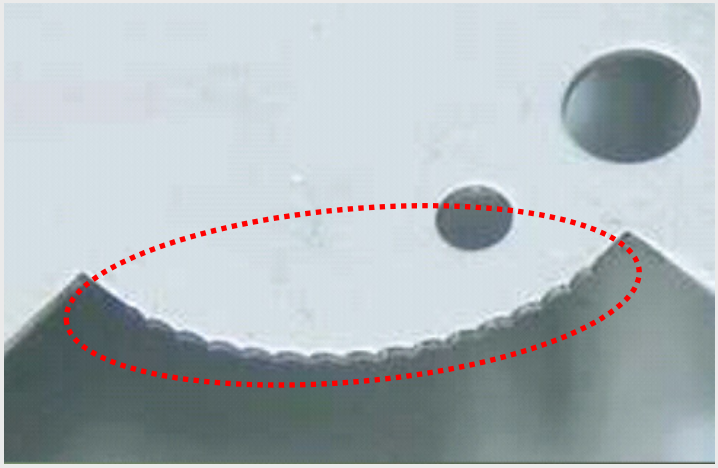
without Special Tools & Semi-Standard Tools

Contouring Tool



Nibbling Track Issues

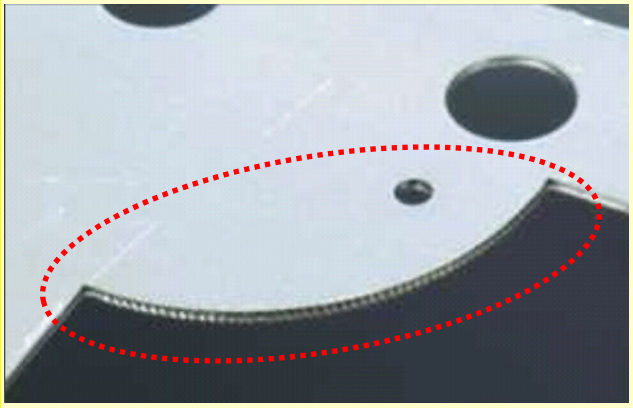
- It takes costs and delivery time for each special tools.
- It takes man-hours due to hand work by using a sander and filing.



※Deburring work and nibbling track removal work are carried out together by using a sander and a file.

Solution

- Fine contouring processing can perform micro pitch feeding which is less than thickness by slug vacuum unit of EM series and new tooling structure!
- Fine edge by Contouring Tool dispenses with filing work, and then it enables low cost and short delivery time.



Productivity!

Post-process Work Reduction

Cost!

Cost-saving for Special Tools

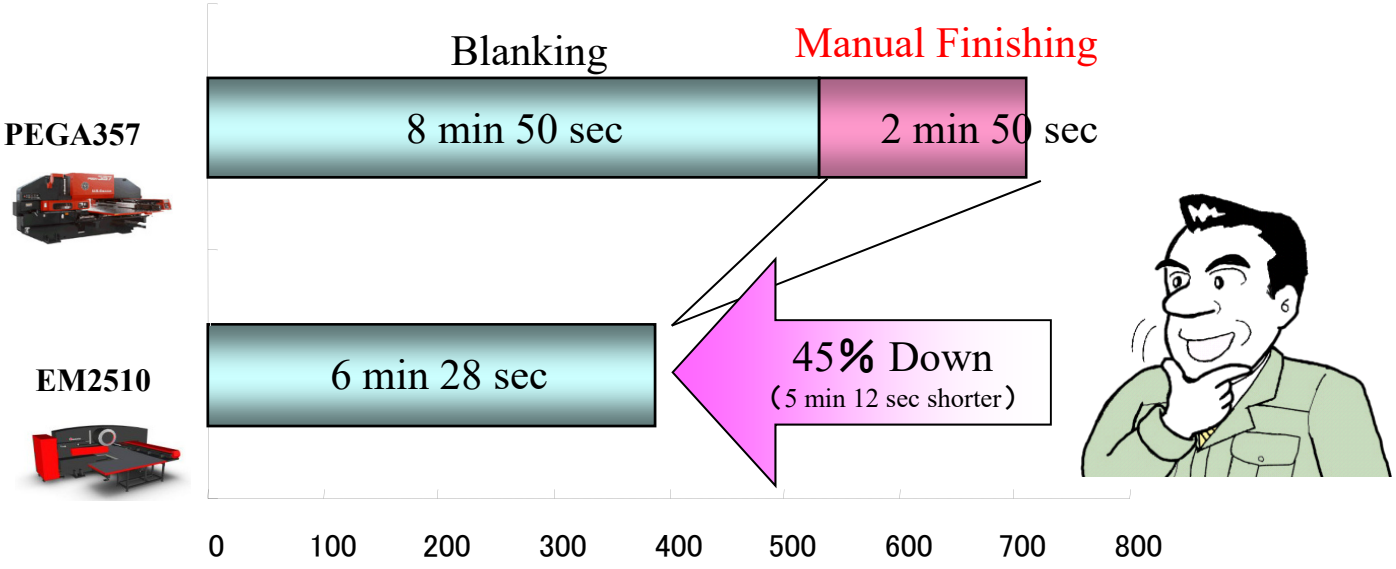
Quality!

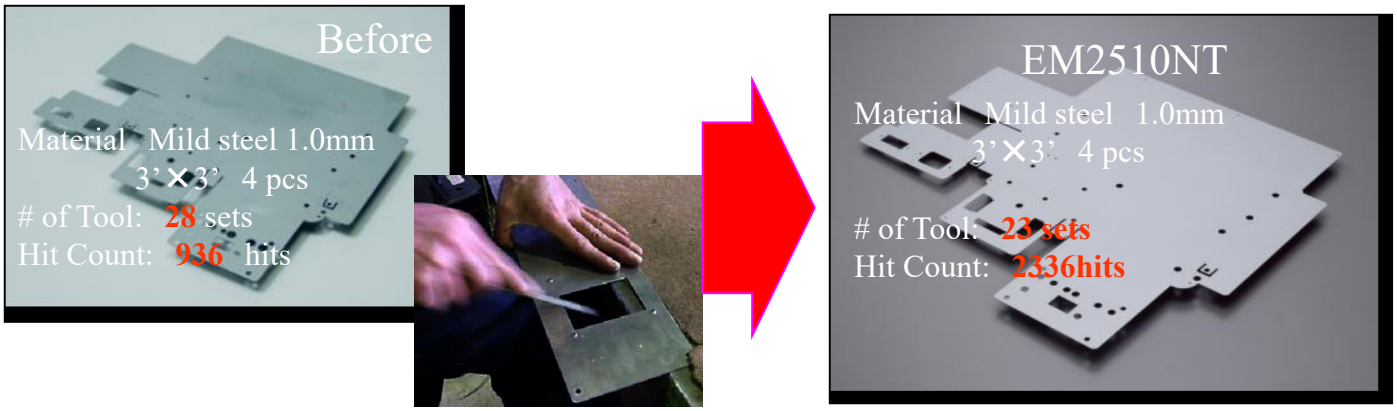
Product Value Enhancement (High Quality Production)

2-②. Introduction Effects of Contouring Tool

Case Example

Reference Data





Customer's Voice

- Several kinds of radius corner shapes, especially obtuse-angled corner radius shape can be performed without any special tools!

- We received an urgent order for components with a special shaped corner radius. But we could produce them by using the contouring tool instead of ordering a special tool!

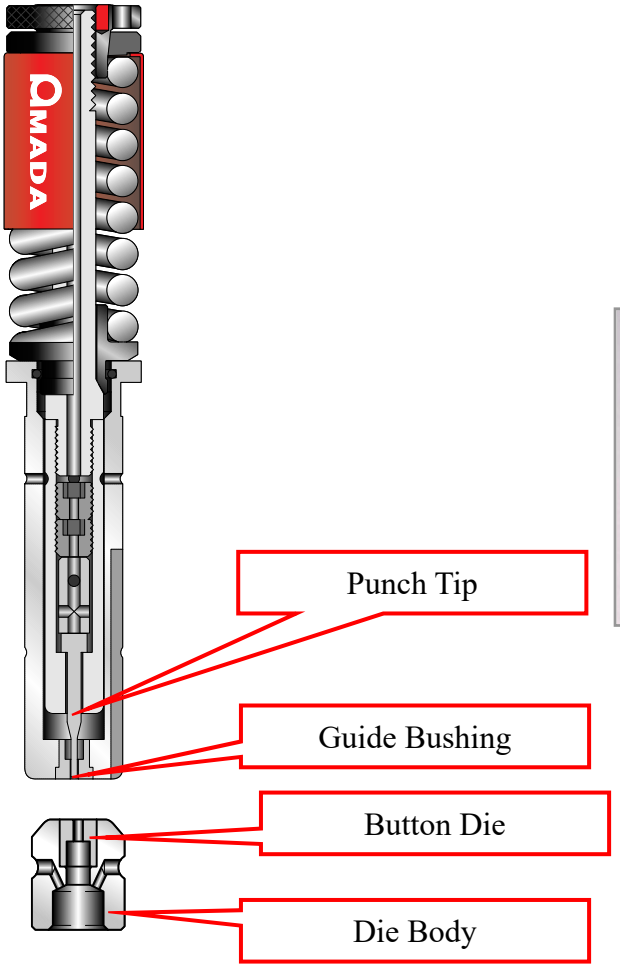
- Contouring tool can perform while minimizing remnant part instead of wire cutting!

Features

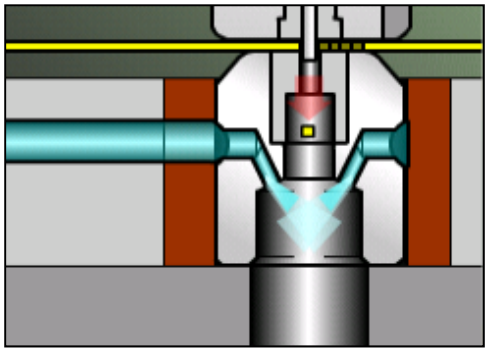
1.Enables nibbling under the pitch less than material thickness.

2.Enables special shaping without any special tools.

3.High Hit Rate



Power Vacuum Unit



0.5mm pitch work available

Specification

Tool Type	NCT Long
Tool Size	Ast:1/2”
Punch Tip Size	φ2.0 (recommended size)
Applicable Die	Power Vacuum
Punch Tip Grade	Coating / Carbide
Die Tip Grade	SKH / Carbide

Punch Tip Grade	Applicable Material & Max. Thickness
Coating	Mild Steel: 1.6mm / Stainless:1.0mm Aluminum: NA
Carbide	Mild Steel: 2.3mm Stainless/Aluminum: NA

Die Clearance Table for Material & Thickness

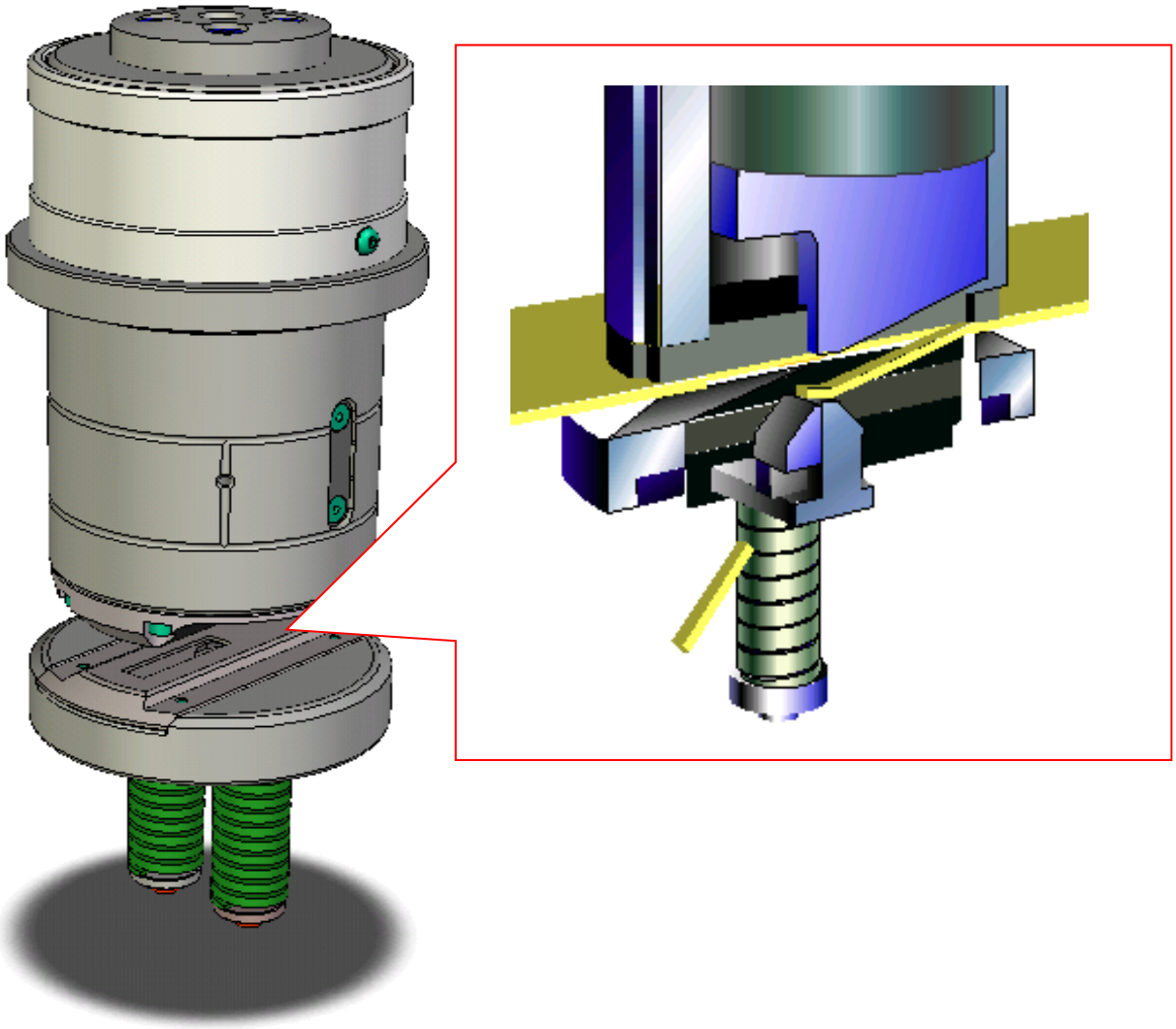
	Thickness (mm)				
Material	0.8	1.0	1.2	1.6	2.3
Mild	0.15	0.15	0.15	0.2	0.3
Stainless	0.15	0.15			

Caution

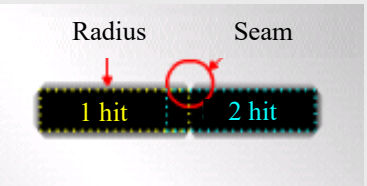
0.5mm pitch contouring work creates a 0.03mm waved pitch mark. Please verify this is within product tolerance.

3. Seamless Slotting Work

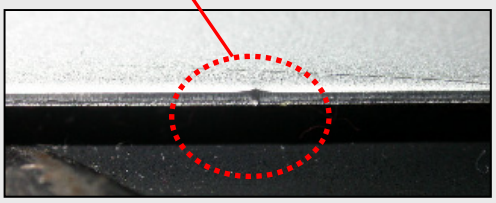
Slotting Tool III



Seam (Notch) Track Removal Work Issues



- Hand work takes man-hours.
- Hand work causes unstable quality.



※Seam track removal work by a sander or a file is performed together with deburring work.

Solution

- Seamless (notch-less) processing is realized by using ram stroke control of EM series!
- Total productivity improves by integrating the seam (notch) track removal work into the blanking process.
In addition, the quality will stabilize.

Productivity !

Smooth Process Shift

Cost !

Process Time Reduction
(Profit Increase)

Quality !

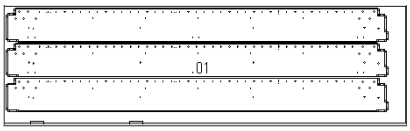
Product Value Improvement
(High Quality Production)

3-②. Introduction Effects of Slotting Tool III

Case Example

Reference Data

Sheet Name：B-46
# of Parts：3 pcs/sheet

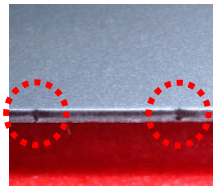


PEGA

Blanking 6 min 14 sec ＋Seam Removal Work

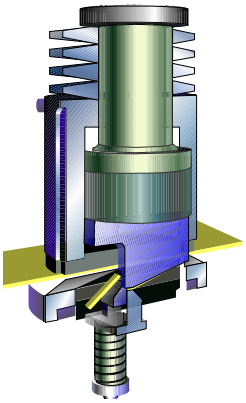
EM
Normal Blanking

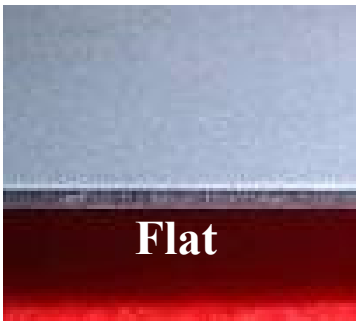
Blanking 3 min 26 sec ＋Seam Removal Work



EM
Slotting

Blanking＋Seam Removal Work 6 min 3 sec





Customer's Voice

▪Laser cutting causes a thermal deformation on long components, and it makes bending accuracy poor and requires the shearing process. But Slotting Tool III could realize the intensive process by NCT work!

▪Laser cutting is not suited for processing pure aluminum and brass material. But they can be processed with high quality and without seams using Slotting Tool III!

▪Laser cutting could not provide seamless radius edges indicated in the drawing instruction. But Slotting Tool III can provide seamless radius edges!

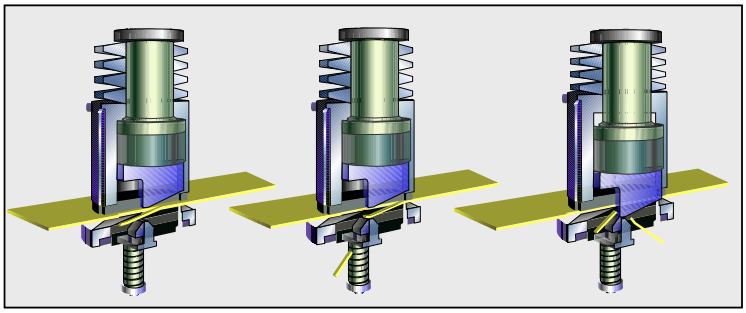
Features

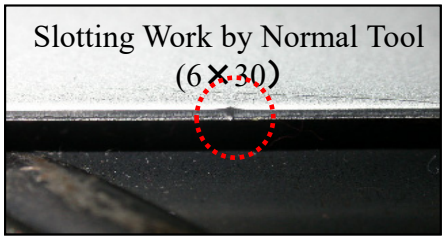
1.Yield improvement by sheet-saver

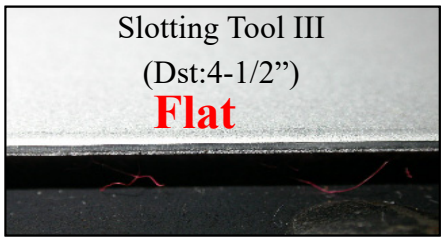
2.Seamless processing until re-clamping

3.Interference avoidance (formed portion / clamps) by double side relief

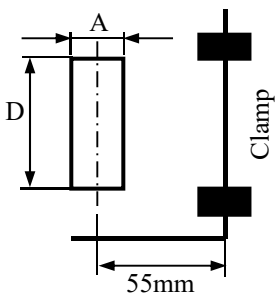
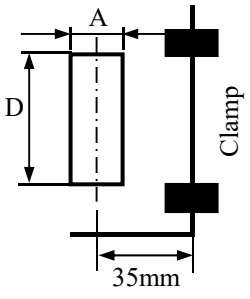
Slotting Image







Specification

Tool Size		Cst:2"	Dst:3-1/2"	Est:4-1/2"
Punch Type		Solid Punch Body	Punch Tip - Replacement Style	
Die Type		Die Plate - Replacement Style		
Die Tip Type		Die Tip - Replacement Style		
Punch Size (A size)		6mm~10mm		
Applicable Material Max. Thickness	Mild Steel※1	1.6mm	2.3mm	
	Stainless※2	1.5mm	1.5mm(2.00mm※3)	
	Aluminum※2	1.5mm	3.0mm	
Proper Clearance		t×20%~25% *t: thickness		
Machine Specification		Limited to the machine with air-blow unit※4		
Max. Slotting Pitch (D)		15mm	1.6mm<t→20mm t≦1.6mm→25mm	1.6mm<t→30mm t≦1.6mm→35mm
Dead Zone				

※1 In case of hot rolled steel, please be sure to clean the tooling every 3,000 hits. The black coating is peeled off from the surface and makes trouble. If not, there is a danger of tooling being damaged.

※2 Slotting Tool III is not allowed if the material has vinyl protection sheet on rear side (die side). It causes slug clogging etc.

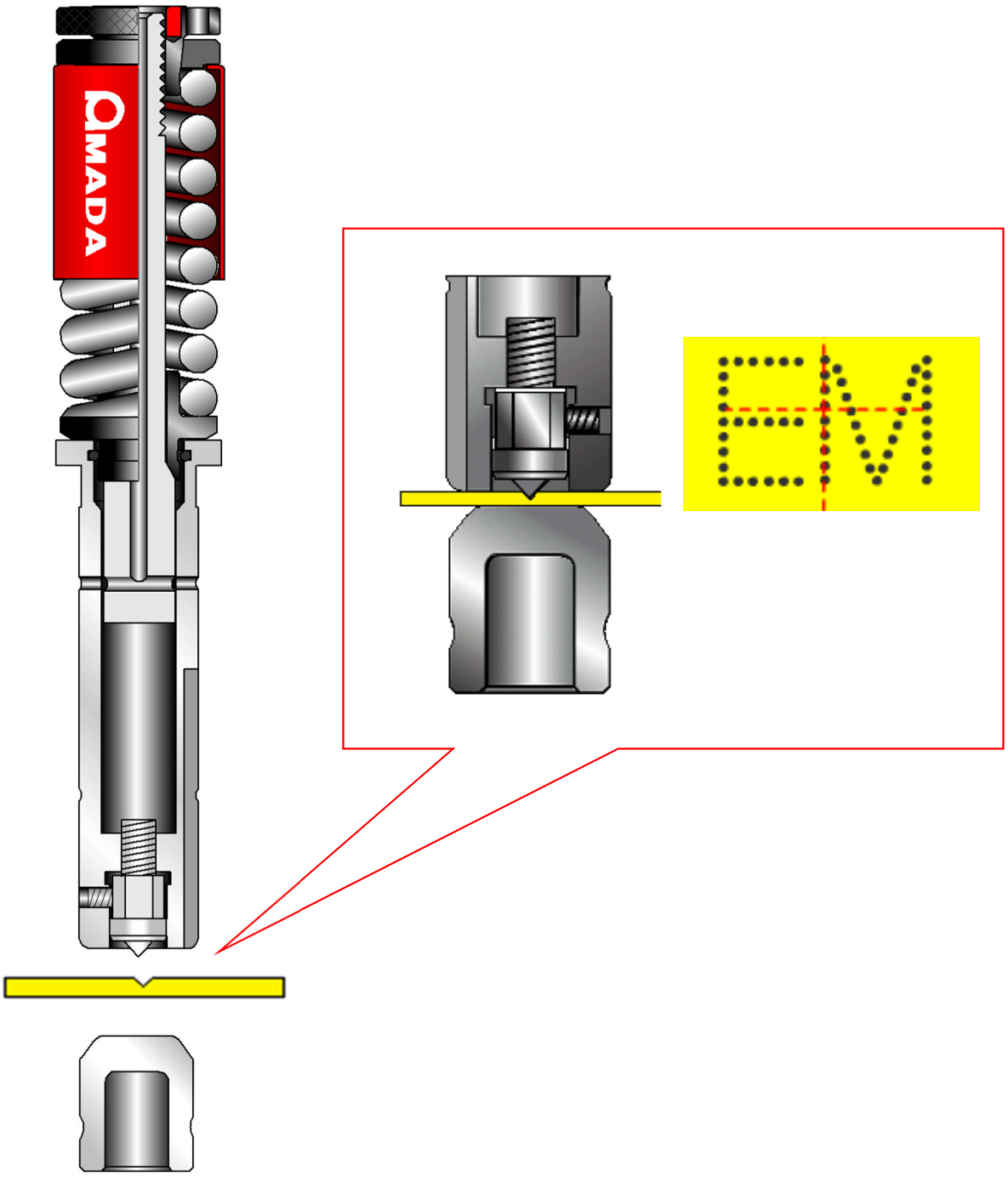
※3 APH punch tip is optional.

※4 Air-blow unit is necessary for Slotting Tool III. Slug rising / clogging etc will occur if they are not used together. Besides, it makes the tooling life extremely shorter and gives damages on the tooling.

※ Programming software of Slotting Tool III is optional.

4. Marking Process Integration!

High Speed Marking Tool



Marking Work Issues

1. Process shift takes time. Blanking ⇒ Marking ⇒ Bending
2. Materials get damaged in handling.
3. Marking mistakes / forgetfulness happen!
4. It is difficult to mark on exactly same position every time.

Marking work is included in post-process after blanking.

Solution

▪Marking work is performed on EM machine utilizing high speed processing capacity!
Manual marking work can be integrated into NCT work.

Advantages of Marking Process Integration

1. Significant Process Time Reduction
2. Labor (Man-hour) Cost Reduction
3. Scratched Defective Reduction
4. Mistake/Forgetfulness Prevention

4-②. Introduction Effects of High Speed Marking Tool

Case Example

Reference Data

# of Parts：9 pcs/Sheet

Marking Character：71-X1234567890

PEGA

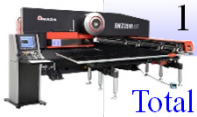
Blanking 3 min 23 sec

Marking (hand work) 3 min 4 sec

Total Process Time 6 min 27 sec

41.3% Time-saving

EM

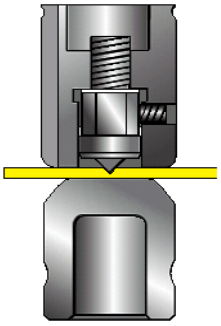


Blanking 1 min 35 sec

Marking (EM) 2 min 12 sec

Total Process Time 3 min 47 sec

※Reference data is based on EM machine.



Customer's Voice

▪We used to mark management numbering on each part by hand. And it caused a bottleneck due to human errors such as mistakes or forgetfulness. But integrated marking process solved this issues!

▪Integrated marking process reduced man-hours, so we could put labors into bottleneck process!

▪Flexible marking is useful for oblique bending guide and bending direction support etc!

Features

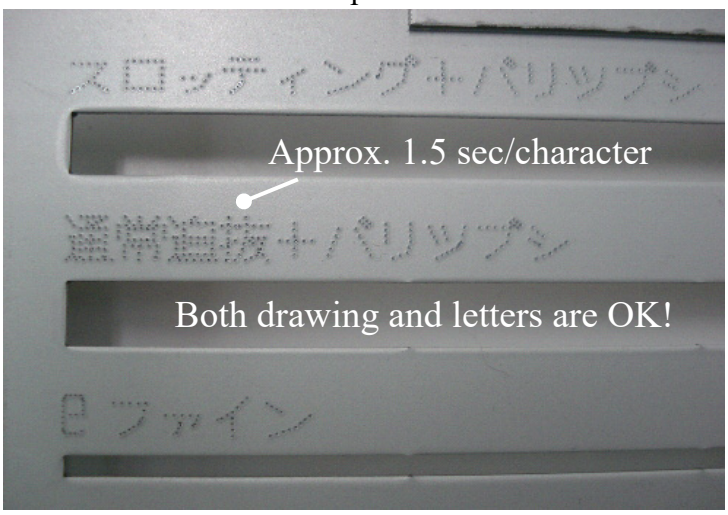
1.Dot marking can be performed on EM/AE by utilizing high speed capacity.

2.AP100 availability enables flexible marking including drawing and letters.

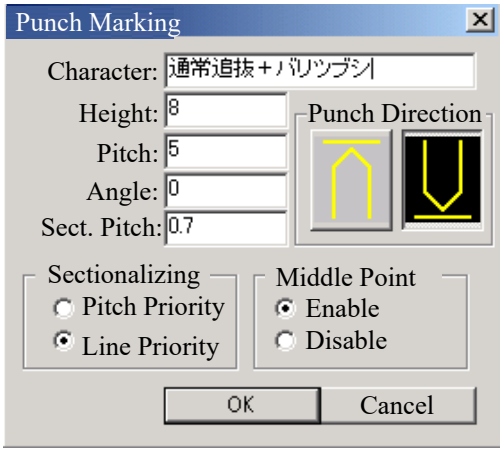
3.Air-blow type enables intensive hit counts.

Marking Sample

Marks on the components such as process instruction, parts name, lot#, and bending guide can avoid mistakes and increase the efficiency in the post-process!



AP100 Punch Marking Function



※Time varies by pitch, stroke and the number of punching.

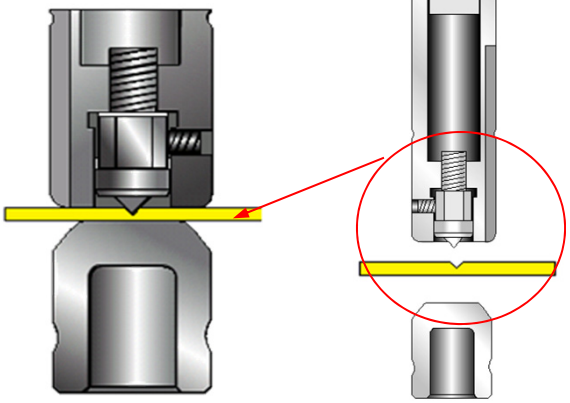
Specification

Tool Type	NCT Long Ast:1/2" Air-blow
Material Thickness	Nonadjustable Type Max. thickness：6.0mm
Material	Mild Steel・Stainless・Aluminum
Form Direction	Downward（Mark on punch side）
Punch Tip	Angle：90° Depth is adjustable.
Auto Program	Applicable to AP100

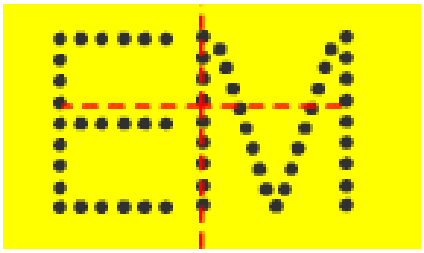
Reference Hit rate（Stroke=1.4mm Pitch=0.5mm）

EM2510NT	1800 min^{-1} { hpm }

※ Caution Punch and die will be broken if they are directly punched without a sheet material between them.

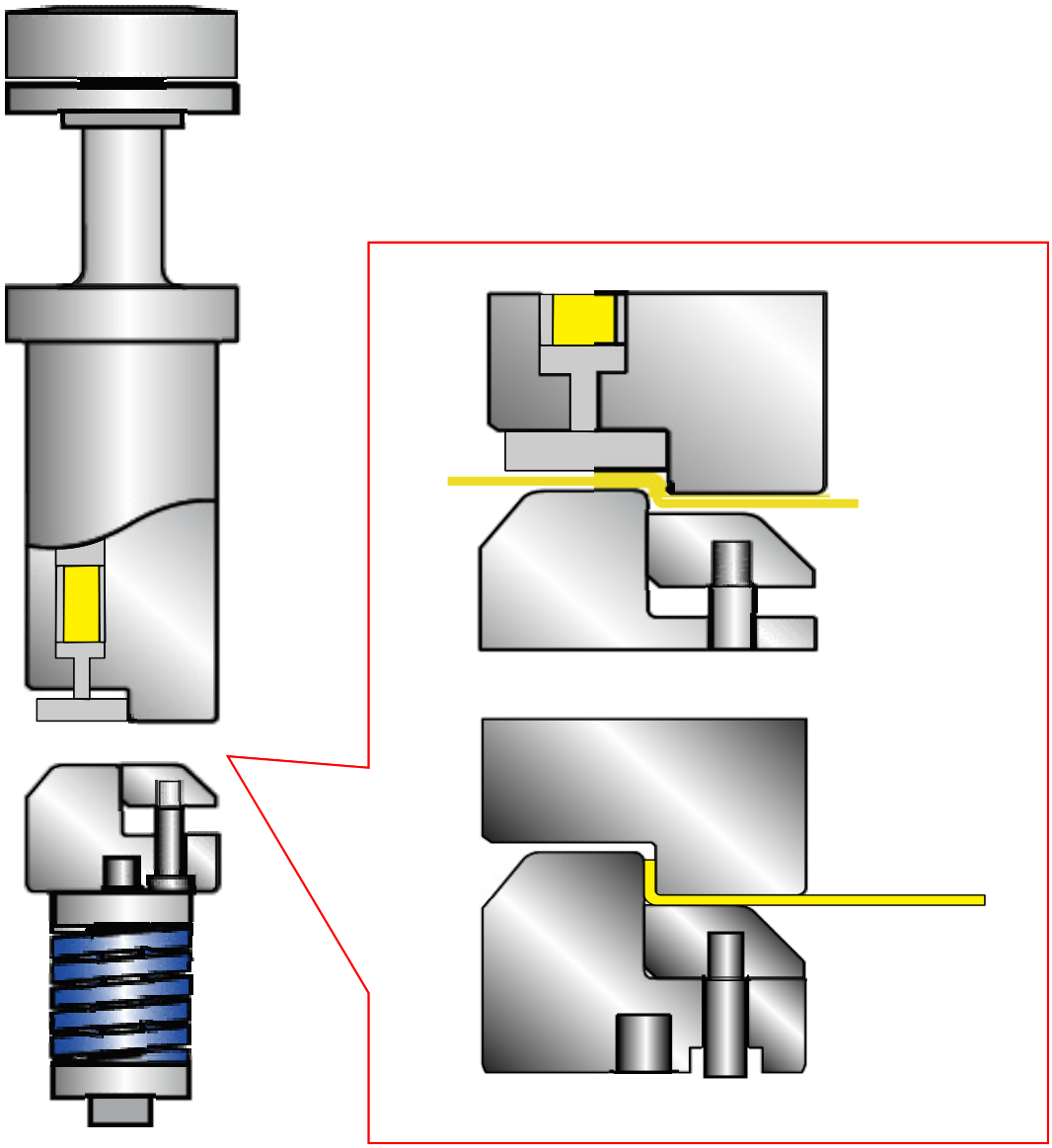


Marking Image



5. High Speed Offset Processing !

Endless Forming Tool



Small Lot, Multi Process Issues

- Small lot work needs to use bending machine or press machine, so operation is not efficient.
- It takes costs and delivery time for special tools.

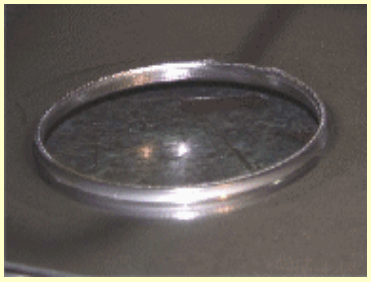
✱Material thickness offset
✱Flange processing for pipe welding
✱Various flange height processing for prototype

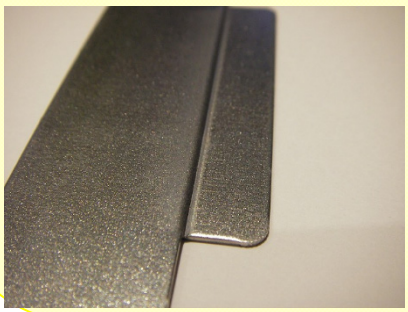
Solution

Various forming can be performed by EM series functions including high speed transfer, high accuracy stroke control, high feed clearance and brush float table!

Both straight line and free curve (15mm radius or more) can be formed by using Endless Forming Tool (Offset / Burring)!

※ The tool will be designed exclusively to meet thickness and material.





Quality!

Product Value Improvement
(Quick Prototype Delivery)

Productivity!

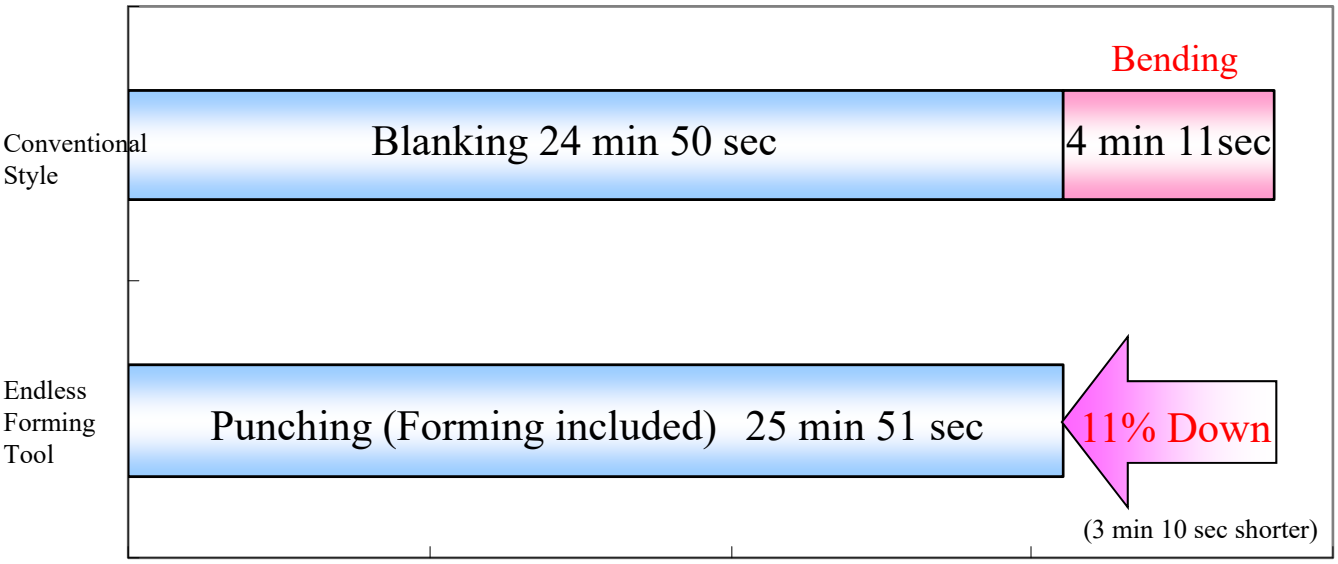
NCT machine only

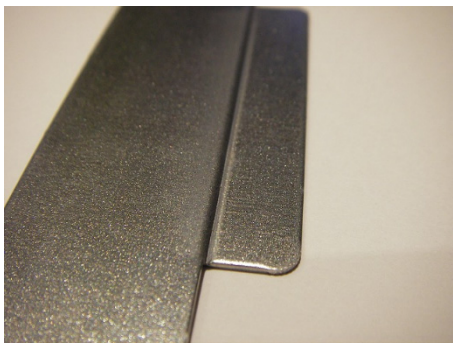
Cost!

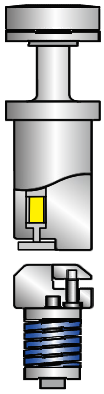
Cost Reduction
for Special Tools

Case Example

Reference Data







Customer's Voice

▪I used to associate offset with press brake. But low tolerance offsets can be made by NCT machine now!

▪New tools were required whenever new designs came out. But now this tool can form any design under the same material thickness condition. It saved cost and delivery time!

▪ The flange of various size for pipe welding can be formed by NCT machine. It saved cost!

Features

1.Straight Line / Free Curve Form by Endless Forming Tool
(offset for step-bending / burring for flange)

2.Integrated Blanking Process without the use of press brake and press machine

3.Special Tool Cost Reduction for small lots and prototype

Specification

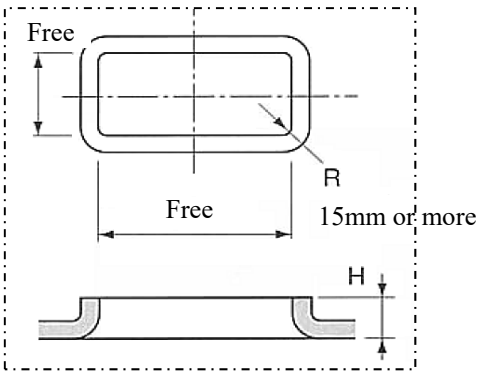
Endless Burring Tool

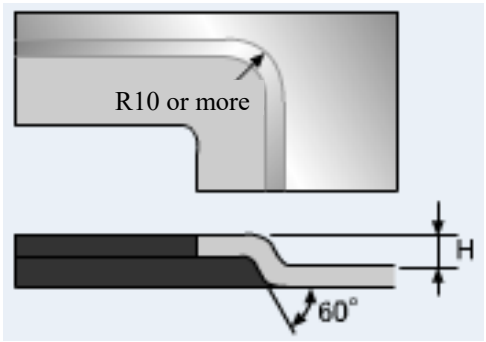
Tool Size	Bst:1-1/4”	
Max. Thickness	Mild	0.5mm~1.6mm
	Aluminum	0.5mm~1.2mm
Max. Height (H)	Long	5.0mm
	Short	3.0mm
Min. Corner R	R15	
Feed Pitch	1.0mm	

Endless Offset Tool

Tool Type Tool Size	NCT Long、 Bst:1-1/4” (Contact us if you need other size)	
Max. Height (H)	In-Out Height 3.5mm	
Max. Angle	60° ※1	
Thickness	Mild/Aluminum	0.5mm~1.6mm
	Stainless	0.5mm~1.2mm
Min. Corner R	R10	

※1 90 DEG is available when offset value is equal to thickness.



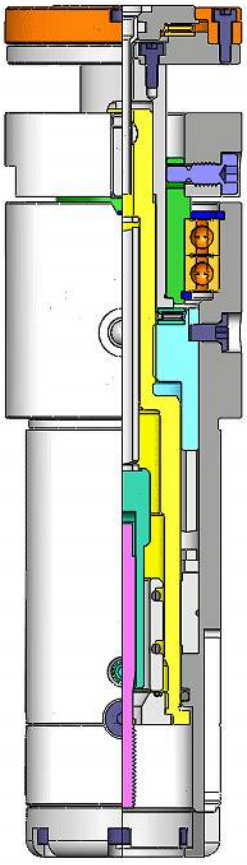


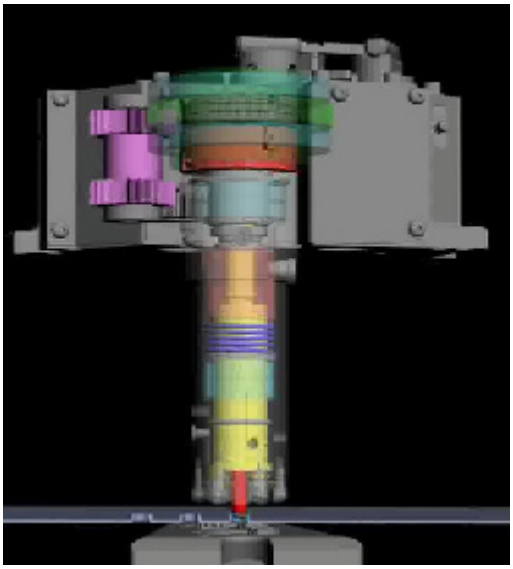
Caution

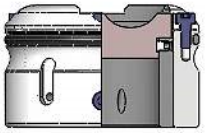
- The tool is designed exclusively to meet material and thickness.
- The deformation occurs at the cross section where start and end points are overlapped.
- The deformation is caused by material and forming condition.

6. Tapping Integration!

MPT Tapping Tool







Tapping Work Issues

1. Process shift takes time. Blanking⇒Tapping⇒ Bending
2. Materials get damages in handling.
3. Tapping forgetfulness happens.
4. Setup time including material handling takes time.

Labor and man-hours are used for secondary work such as deburring or tapping after blanking work.

Solution

Most of them can be performed by blanking work.

Advantage of Tapping Process Integration

1. Production Time Reduction
2. Labor (Man-hour) Cost Reduction
3. Scratched Defective Reduction
4. Tapping Forgetfulness Prevention

Case Example

Reference Data

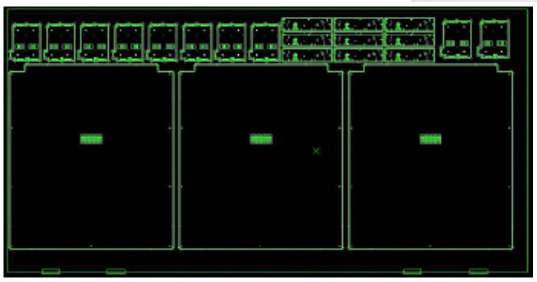
Conventional Machine
8-axis Multi Tap

15 min 34 sec
(1 tap: 4.5 sec)

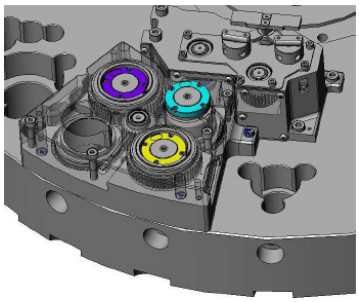
EM MII SERIES

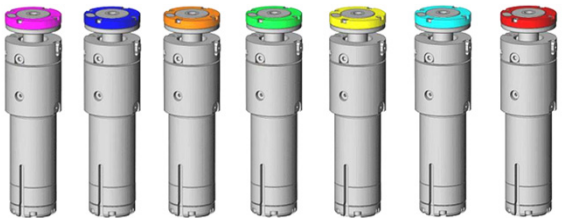
11 min 36 sec
(1 tap: 2.5 sec)

Productivity 1.3 times



Material：Electro-galvanized
Thickness：1.2mm
Size：2438mm×1219mm
# of Tapping：67





M2.5 Purple　M2.6 Blue　M3 Orange　M4 Green　M5 Yellow　M6 Aqua　M8 Red

Customer's Voice

▪Tapping mistakes and forgetfulness happened when hundreds of taps on one product are required. But this was solved by a blanking work!

▪Integrated tapping process reduced man-hours, so we could put labor into bottleneck process!

▪A large heavy blanked sheet needs to be handled for tapping, but now we do not need to do it by the tapping process integration!

Tapping work can be integrated by MPT Tapping Tool.

<Feature>

◇Stripper-free structure reduces processing restriction for tap work and forming.
◇Tap break detecting function reduces defectives.
◇Processing range is same as punching, so change of clamping/coordinates are needless.
◇Both cutting tap and forming tap can be used by changing tap and conditions.
◇Shear-pin reduces risk of tooling damage.

MPT Tapping Tool Punch Assembly
（Cutting / Forming common）

Shear-pin
※ This shear-pin protects the master screw by breaking itself when excessive overload was applied to the tapping tool.

Tap (Cutting / Forming)

MPT Tapping Tool Die Assembly
Size is common.
(Cutting / Forming common)

Type-A
(φ1010-turret / King-turret)

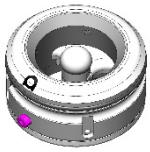
・EMK-MII
・LS2612E
・C1（C1AJ）
・EM-MII

Type-B
(ZR-turret / Z-turret)

・ACIES
・EM-ZR
・EMZ-MII

High Power Tap Die※1
（Recommended for 4.5mm～6.0mm
*Mild Steel only）

Type-A



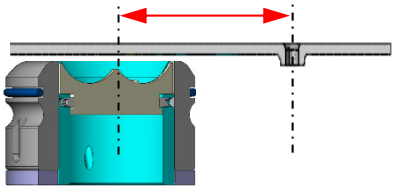
Type-B

<Specification>

Station Size	MPT Tap Unit （Bst：1-1/4"） 4 stations
Tap Type	Cutting / Forming（Amada spec. tap）
Tap Size	M2.5・M2.6・M3・M4・M5・M6・M8
Material Thickness	Max. 6.0mm （Forming included）
Material Type	Mild steel / Stainless steel / Aluminum
Thread Grade	ISO Grade 6H (JIS-Grade 2nd) equiv.
Work Time	Approx. 2 sec / tap （Case : Mild Steel / 6mm or less）
Tip-break Sensor	Available
Tapping Oil	Combination machines：AML-46 Punching machines：TANOI SHINCOOL 99X Super
Lubrication	Common with Air-blow Unit（Tank 1.0L）
Swarf Control	Absorption by Slug Suction and Power-Vacuum Unit
Tap Life （Guidance）	Mild Steel 10,000hit Stainless #304 5,000hit

* Not available for EM-NT/AE/EML.

Min.pitch to the next P=30mm



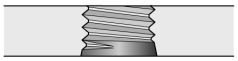
<Maintenance Kit>

Product Name	Set Contents
For EMZR/EM-MII MPT Tapping Tool Maintenance Kit	Grease Gun、Pistol Pump Oiler、Amada Grease SRL、Tap Holder Assembly Jig、TANOI SHINCOOL 99X Super
For LCC1 & ACIES MPT Tapping Tool Maintenance Kit	Grease Gun、Pistol Pump Oiler、Amada Grease SRL、Tap Holder Assembly Jig、AML46

※1 Please use a tip-breaker tap for M5 & M6.

6-④. MPT Tapping Work Application Range

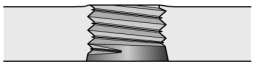
Cutting Tap



Mild Steel Aluminum	M2.5	M2.6	M3	M4	M5	M6	M8
Thickness 1.2 mm	○	○	-	-	-	-	-
Thickness 1.6 mm	○	○	○	-	-	-	-
Thickness 2.3 mm	○	○	○	○	○	-	-
Thickness 3.2 mm	○	○	○	○	○	○	-
Thickness 4.5 mm	-	-	○	●	●	●	○
Thickness 6.0 mm	-	-	-	●	●	●	○

Stainless	M2.5	M2.6	M3	M4	M5	M6	M8
Thickness 1.5 mm	○	○	○	-	-	-	-
Thickness 2.0 mm	○	○	○	○	-	-	-
Thickness 2.5 mm	-	-	-	○	○	-	-
Thickness 3.0 mm	-	-	-	○	○	○	-
Thickness 4.0 mm	-	-	-	-	●	●	○
Thickness 5.0 mm	-	-	-	-	-	●	○

Forming Tap



Mild Steel Aluminum	M2.5	M2.6	M3	M4	M5	M6	M8
Thickness 1.2 mm	○	○	-	-	-	-	-
Thickness 1.6 mm	○	○	○	-	-	-	-
Thickness 2.3 mm	○	○	○	○	○	-	-
Thickness 3.2 mm	○	○	○	○	○	○	-
Thickness 4.5 mm	-	-	○	○	○	○	○
Thickness 6.0 mm	-	-	-	○	○	○	○

Stainless	M2.5	M2.6	M3	M4	M5	M6	M8
Thickness 1.5 mm	○	○	○	-	-	-	-
Thickness 2.0 mm	○	○	○	○	-	-	-
Thickness 2.5 mm	-	-	-	○	○	-	-
Thickness 3.0 mm	-	-	-	○	○	○	-
Thickness 4.0 mm	-	-	-	-	○	○	○
Thickness 5.0 mm	-	-	-	-	-	○	○

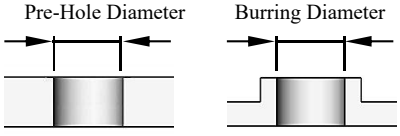
: Recommended High Power Tap Die (*Mild Steel only)

○ : Standard specification tap range

● : Tip-breaker type tap is recommended

Regarding "●" marked areas in the upper table - Tip-breaker type tap is recommended to avoid the swarf pile-up issue in the tapping die.

Recommended Pre-Hole Diameter



Standard specification tap

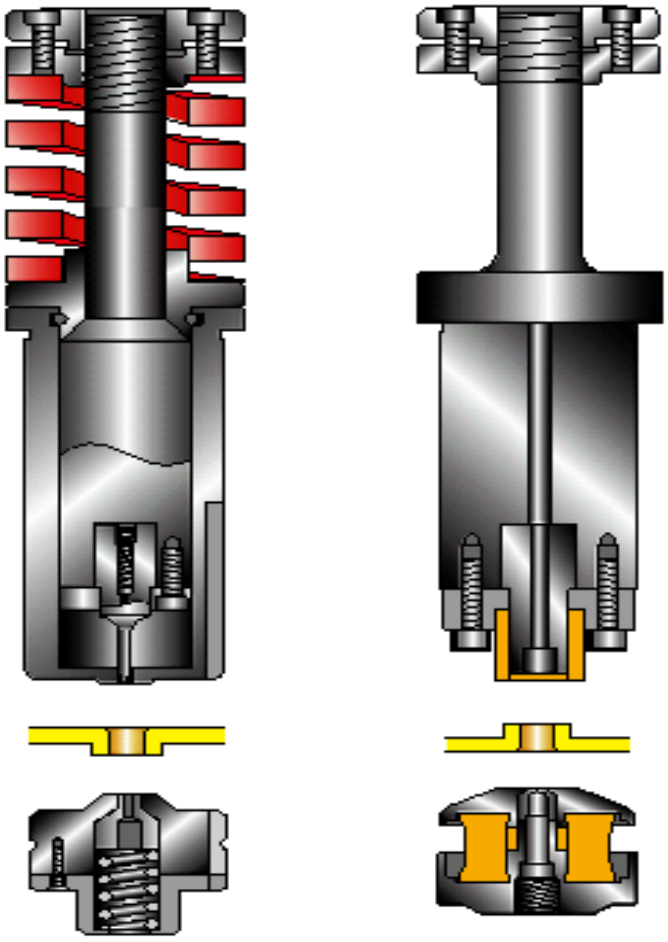
Tip-breaker type tap

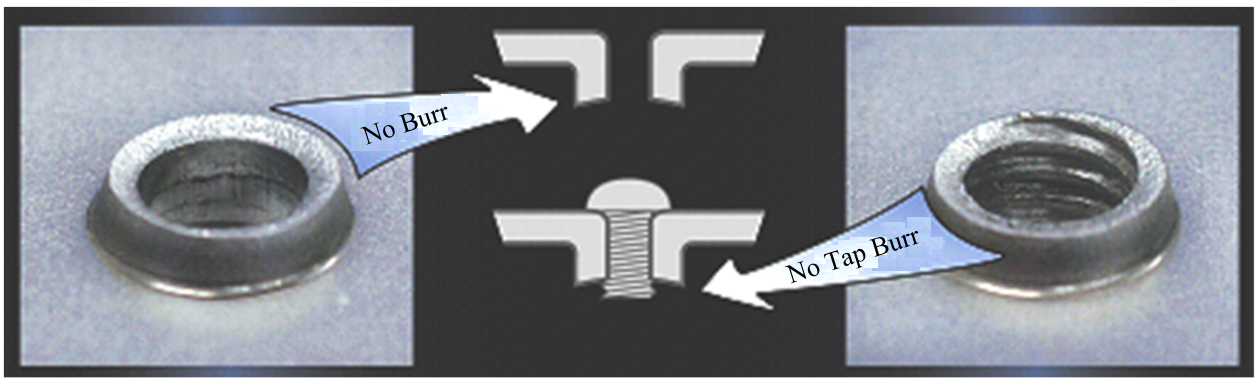
Thread Size		M2.5	M2.6	M3	M4	M5	M6	M8
Pitch		0.45	0.45	0.5	0.7	0.8	1.0	1.25
Pre-Hole Diameter Extrusion Diameter	Cutting	Φ2.1	Φ2.2	Φ2.57	Φ3.4	Φ4.3	Φ5.1	Φ6.9
	Forming	Φ2.3	Φ2.4	Φ2.75	Φ3.65	Φ4.6	Φ5.55	Φ7.4

* Pre-hole should be recommended to be done not by laser but by punching.
(The pre-hole by laser may cause the tap-working life reduction or tip break.)

7. Extrusion Quality Improvement!

BK Burring Tool

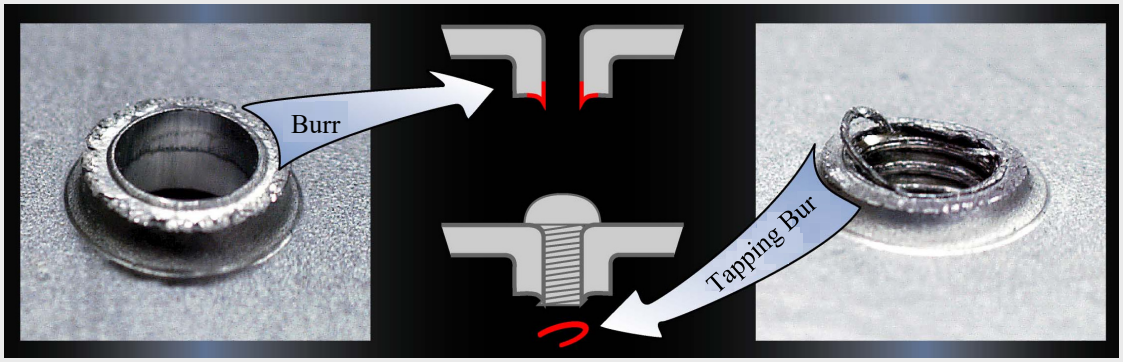




Tapping Burrs (Extrusion Burrs) Removal Work Issues

1. It takes man-hours and costs for removal work!
2. Hand work causes mistakes and forgetfulness!

◆The inside of an extrusion hole is pushed out like burrs. ◆Ring burrs appear by tapping.



Tapping burrs removal work is performed by hand work after tapping.

Solution

▪BK Burring Tool realized burr-less processing!
Hand work is eliminated by integrated blanking process.

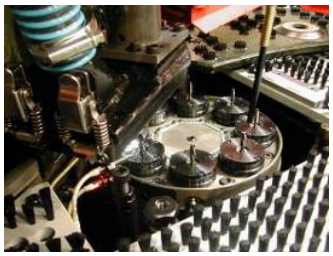
Advantages of Integrated Blanking Process

1. Production Time Reduction
2. Labor (Man-hour) Cost Reduction
3. Electric Short Circuit (Ring Burrs) Defects Elimination

Case Example

Reference Data

Before	Blanking	Burring＋Cutting Tap	Burrs Removal Work (Hand Work)
BK Burring Tool	Blanking	BK Burring＋Cutting Tap	Time-saving



Customer's Voice

▪ Tapping mistakes and forgetfulness happened when hundreds of taps on one product are required. But those were solved by a blanking work!

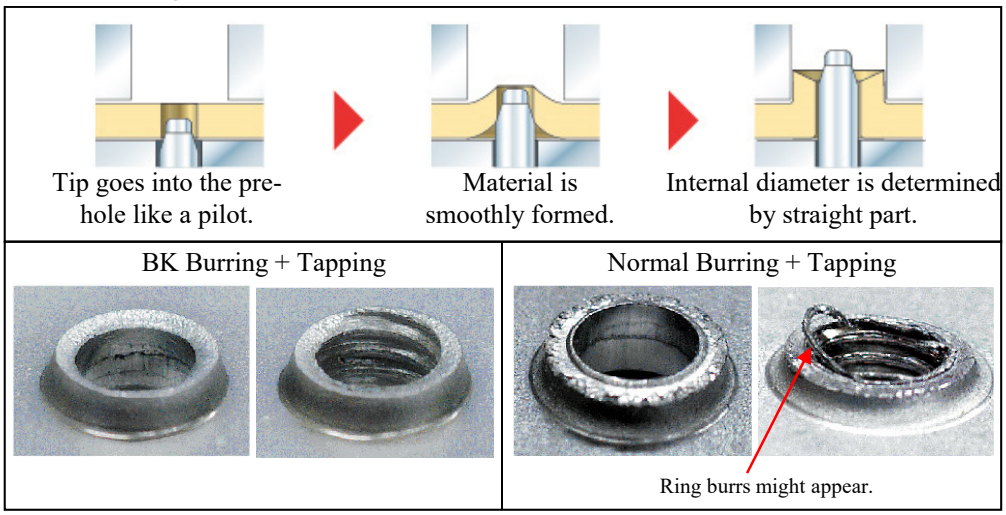
▪ Integrated blanking process reduced man-hours, so we could put labor into bottleneck process!

▪ A large heavy blanked sheet needed to be handled for removal work, but now we do not need to do it by the blanking process integration!

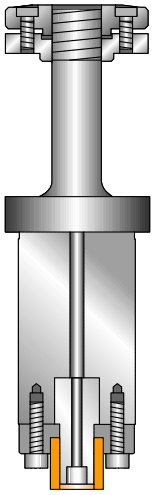
Features

1.Burr-less Extrusion Work
2.Tapping Burrs (Extrusion Burrs) Removal Work Elimination
3.Product Value Improvement

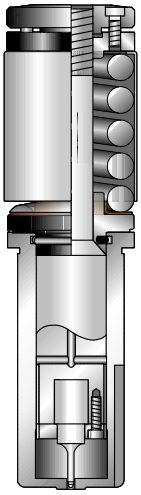
BK Burring Mechanism

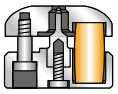


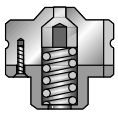
Form-up BK Burring Tool



Form-down BK Burring Tool







Form-up Die for Stainless

Specification

Tool Type	Form-up two-hit	Form-down two-hit
Tool Size	Bst:1-1/4”	
Material	Mild Steel / Aluminum（Stainless: up to 1.2mm）	
Thickness	0.8mm~1.6mm	0.8mm~2.3mm
Die Height	35.5mm	30.0mm

Die Height

Note：Shoulder radius of die tip of Form-up BK Burring Tool is large. Therefore, open height (die height) becomes 2mm higher than form-up normal burring. Beware of scratches and buckling.
(Open Height:33.5mm→35.5mm)

BK Burring Pre-hole Inner Diameter (Mild Steel･Aluminum･Stainless)

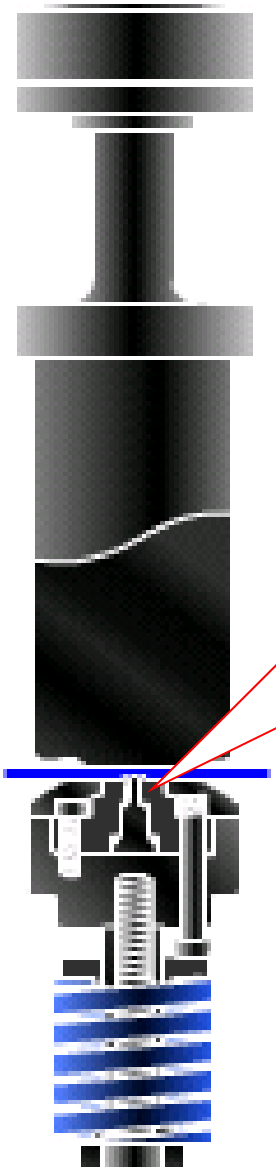
Tap Type	Tap Size	M2.6	M3	M4	M5	M6※
Forming Tap	Extrusion Inner Dia.	ϕ2.37	ϕ2.75	ϕ3.65	ϕ4.60	ϕ5.5
	Pre-hole Inner Dia.	ϕ1.3	ϕ1.6	ϕ2.0	ϕ2.5	ϕ3.0
Cutting Tap	Extrusion Inner Dia.	ϕ2.21	ϕ2.57	ϕ3.40	ϕ4.30	ϕ5.10
	Pre-hole Inner Dia.	ϕ1.3	ϕ1.6	ϕ2.0	ϕ2.5	ϕ3.0

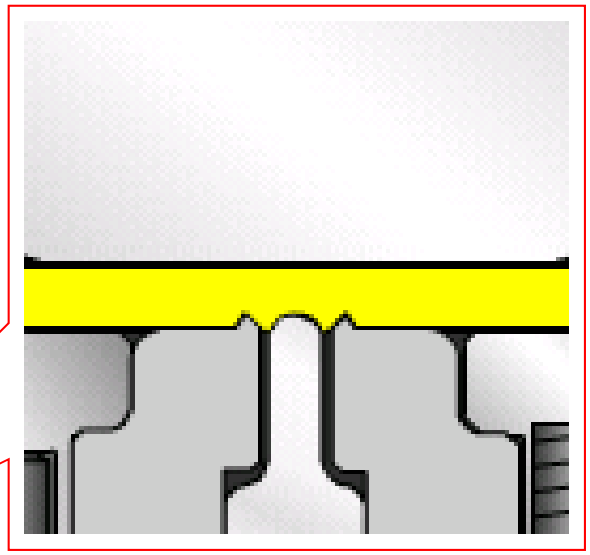
※ Inner diameter of “Tapping Tool for M6” / “Burring Tool for M6 Forming Multi-Tap” is φ5.55.
※ BK Burring Tool is only two-hit type. Pre-hole diameter is specified by AMADA.
※ Extrusion height can not be altered because the diameter value of the pre-hole are fixed.

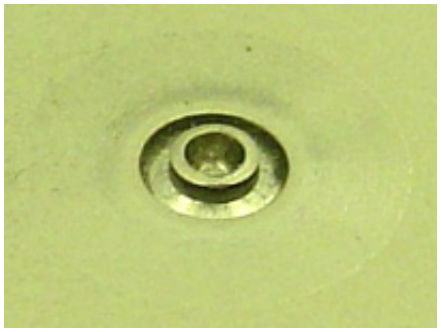
8. Parts Location Improvement!

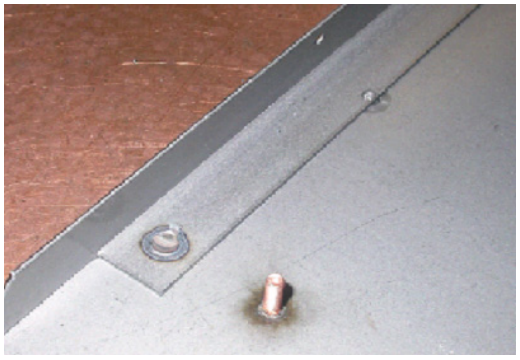
FP Tool

(Flat Positioning)







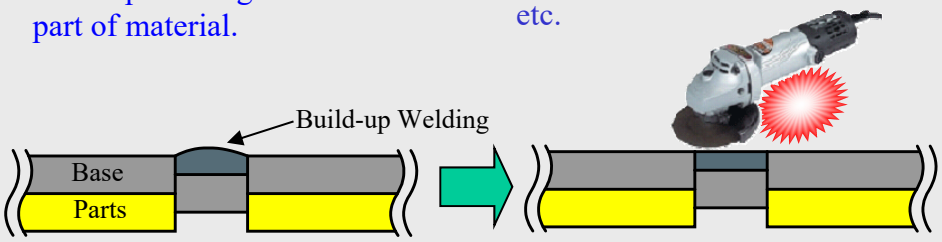


Recess Repairing Work Issues

1. Outsourcing for putty filling is costly.
2. Man-hours for welding are required.
3. Operator forgets a repairing work by mistake!

◆Performs putty filling and build-up welding onto recess part of material.

◆Protruding portions are finished by a sander etc.



A positioning-processing takes man-hours for finish work due to hand work.

Solution

▪FP Tool can reduce the finishing work greatly.
This recess-less processing enables integrated blanking process.

Advantages of Integrated Blanking Process

1. Short Delivery Time
2. Labor (Man-hour) Cost Reduction
   Outsourcing Cost Reduction
3. Human Error Defective Reduction

Case Example

Reference Data

Welding and Finishing

of Sheet: 10
10 places per sheet

【Self-Finishing】

Before: Welding and Finishing 140 min

FP Tool: 130 min Reduction!

→ Sander Finishing after FP processing 10 min

Putty Filing and Finishing

of Sheet:10
10 places per sheet
Per putty filing: 60 yen

【Outsourcing】

Before: Putty Filing and Finishing 6,000 yen

FP Tool: Outsourcing Cost Reduction + Short Delivery!

→ Sander Finishing after FP processing

Customer's Voice

・The deliver time of coating work became faster because putty filling is unnecessary!

・Expense of FP Tool was equal to 3 month expenses of putty filling. The tool brought big profit!

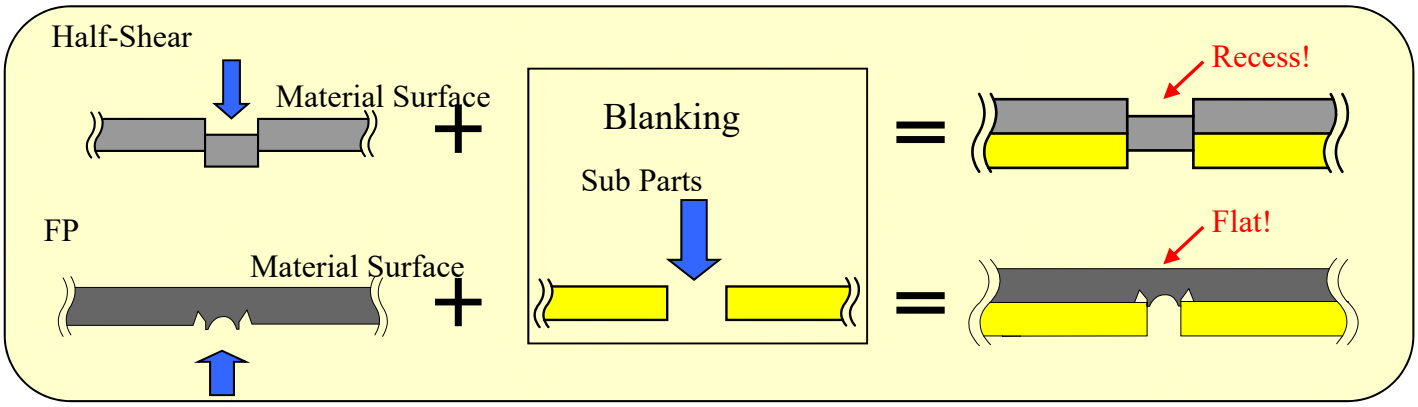
・We used to do welding work, but it was eliminated by FP Tool. Besides, product assembly became easier because deformation of products decreased!

Features

1. Positioning Work Reduction

Recess remains on surface (coating surface) when using half-shear punch. Therefore, recess repairing work was necessary. But FP Tool can eliminate this post-processing because it does not leave recess.

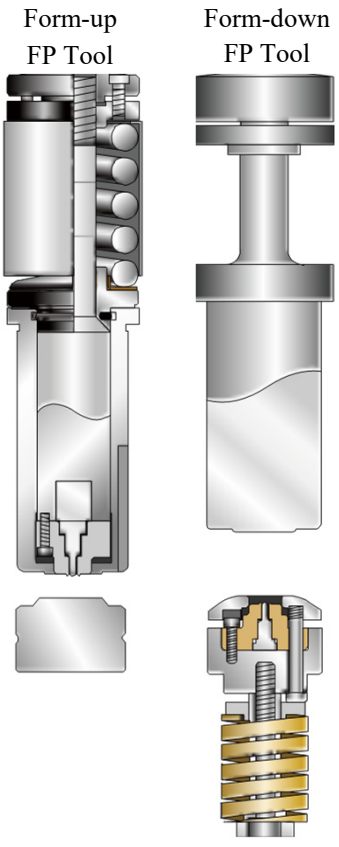
Differences between Half-Shear Tool and FP Tool



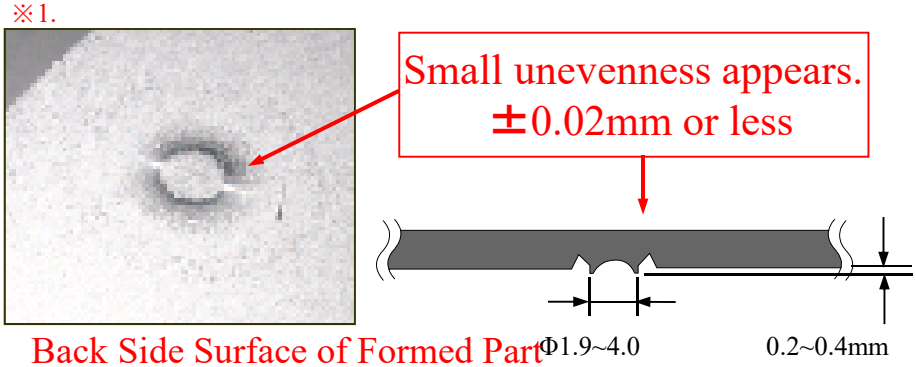
Specification

	Form-up FP Tool	Form-down FP Tool
Tool Type	Long (PDC, P&F available) ・ Short	
Tool Size	Bst:1-1/4"	
Form Side※1	Form-up (Form is on punch side.)	Form-down (Form is on die side.)
Projection Dia.	φ1.9~φ4.0 (Specified Projection Sizes)	
Projection Height	0.2mm~0.4mm (It varies by machine, material thickness, and material grade.)	
Material Thickness	0.8mm (1.0mm common) / 1.0mm (1.2mm common) 1.6mm (specified) /2.0mm (2.3mm common)※3	
Material ※2	Mild Steel (Not applicable for more than 441kN/mm² tensile strength)	
Min. Pitch	15mm	17mm

※1 Small unevenness may appear on rear side of the material marked by FP Tool. (±0.02mm or less)
※2 Not applicable for stainless steel and vinyl sheet-covered aluminum.
※3 In case of 2.0mm or more thickness, some protrusion may occur around projection.

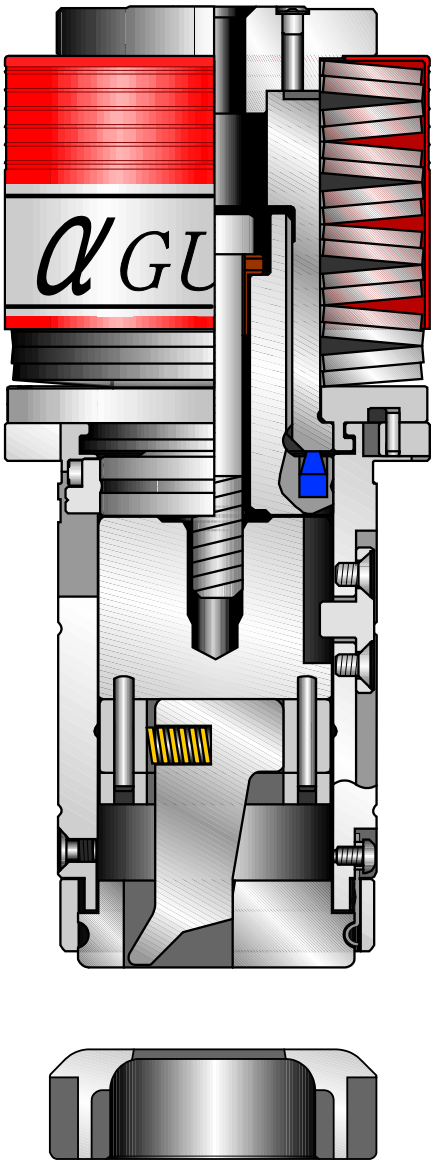


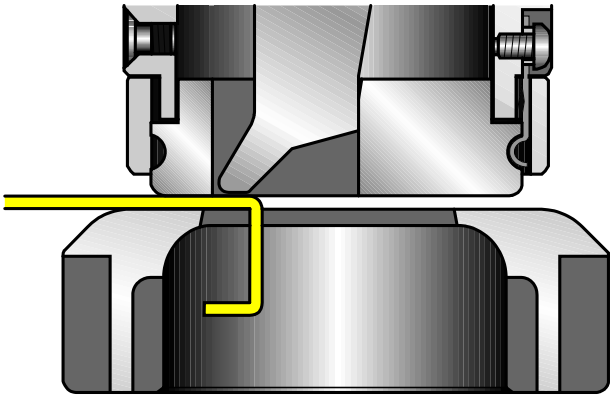
※1.

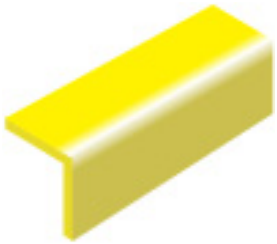


9. Integration of Bending & Micro-joint Separation!

Inch Bend Tool



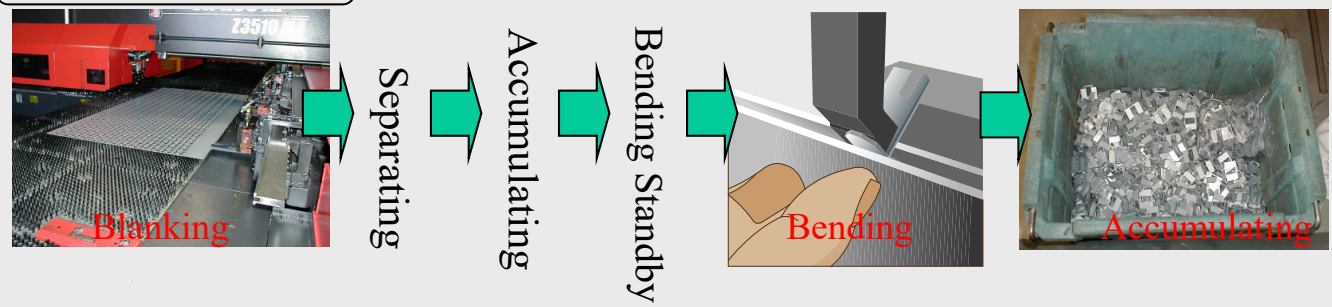




Small Bending Work Issues

1. Separating/Accumulating by Operators → Big Workload
2. Process shift from Blanking to Bending takes time. → Long Delivery
3. Butting portion is too small to process. → Great Danger
4. Butting toward back gauge is unstable. → Defective Increase

Typical Process Step



Small bending work is dangerous!
That is a big burden on the workers at the work sites!

Solution

Total productivity increase and stable quality are realized by integrating small bending work into a blanking machine work.

Productivity!

Productivity Improvement
by integration processing

Cost!

Low Charging Cost
without manpower
(Profit Increase)

Quality!

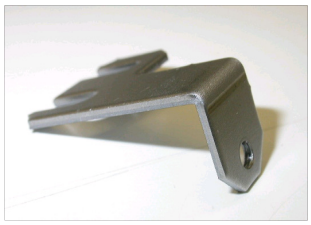
Product Value Improvement
(High Quality Production)

9-②. Introduction Effects

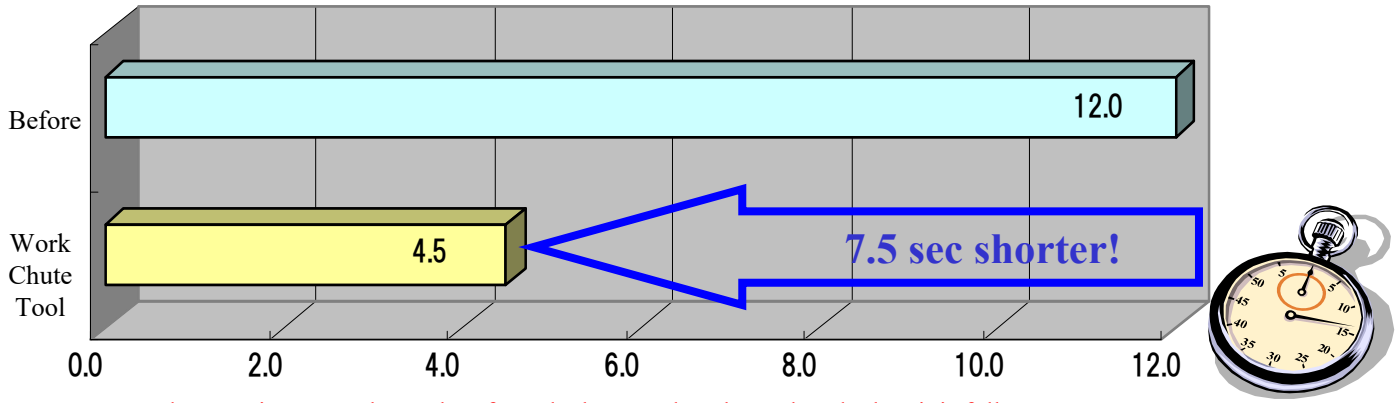
Case Example

Reference Data

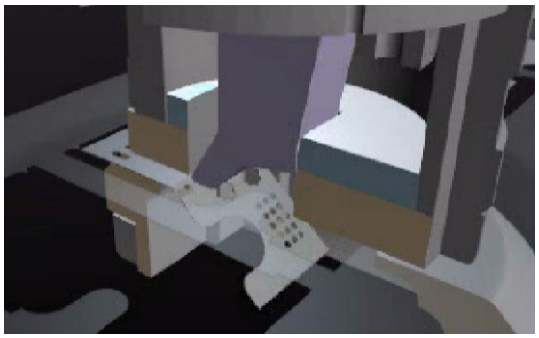
Bending Times per product	1 hit
Production Time per sheet	5.4 sec
# of Parts	3,000 pcs



Time-saving



※Products go into scrap box. Therefore, the box needs to be replaced when it is full.



Customer's Voice

▪Bending work by hand was very dangerous work, but bending by this tool is safe!

▪Processing is integrated into a blanking machine work, and it brought stable quality with short time!

▪Unattended operation by a blanking machine enabled operators to do other work!

Features

1.Form-down small flange bending is possible.

2.Post-processing can be eliminated because burr faces inward.

3.6 kinds of thicknesses can be used by changing die direction.

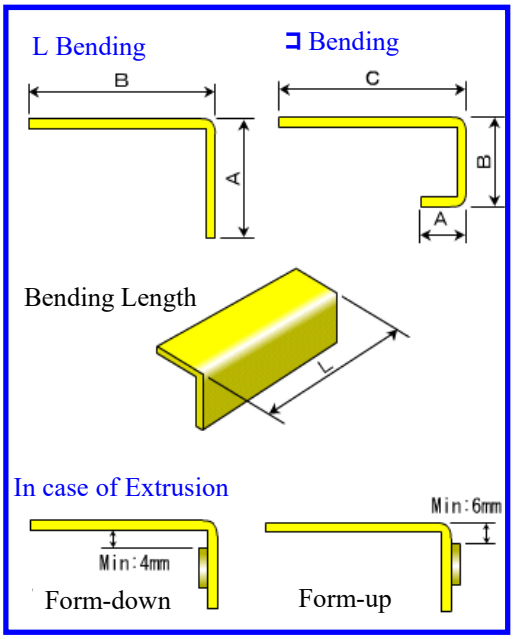
4.Micro flange bending and Continuous feed radius bending are available.

Specification

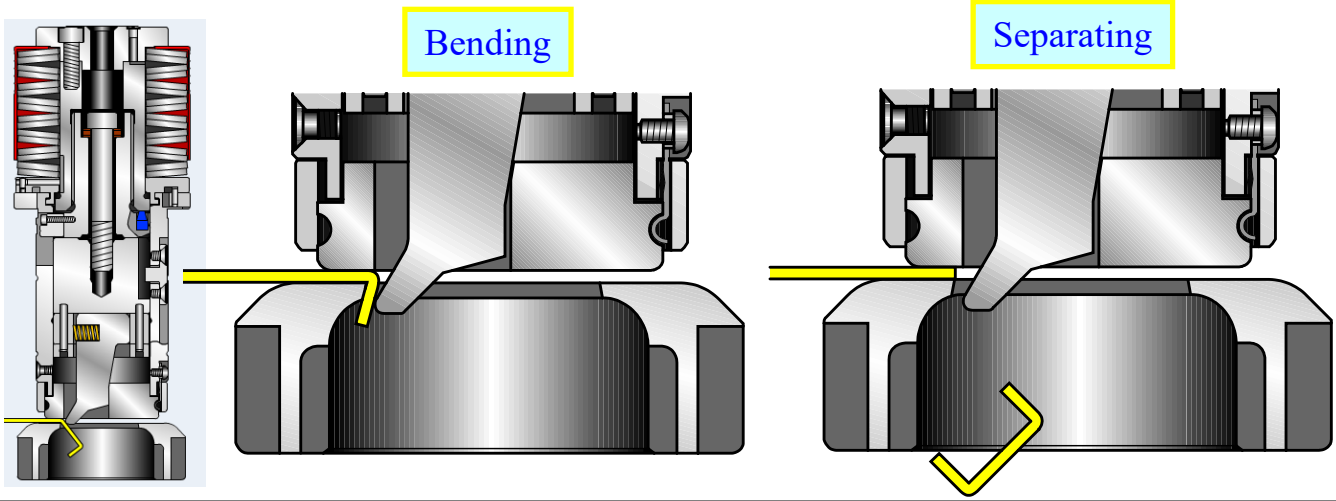
Tool Size	Cst:2”			
Bending Direction	Downward			
Bending Accuracy	±30’			
Thickness（Die 4 faces）	0.5	0.8	1.0/1.2	1.5/1.6
Material	Mild Steel / Stainless / Aluminum			
Max. Bending Length	L=30			
Punch Tip Size	10/15/20/25/30			
Applicable Product Size	$\sqrt{(A^2+B^2+L^2)} < 52$ (In case of ⊐ bending, either longer one of A or C.)			
Bending Flange length	Min		Max	
L Bend(A)	2.0 and 3×t		35.0	
L Bend(B)	5.0		35.0	
⊐ Bend(A)	2.0 and 3×t		12.0(B−2×t＞14) 4.0(B−2×t≦14)	
⊐ Bend(B)	3.5		25.0	
⊐ Bend(C)	5.0		35.0	

※ Please use Cst:2” αGude for Inch Bend Tool.

t = thickness

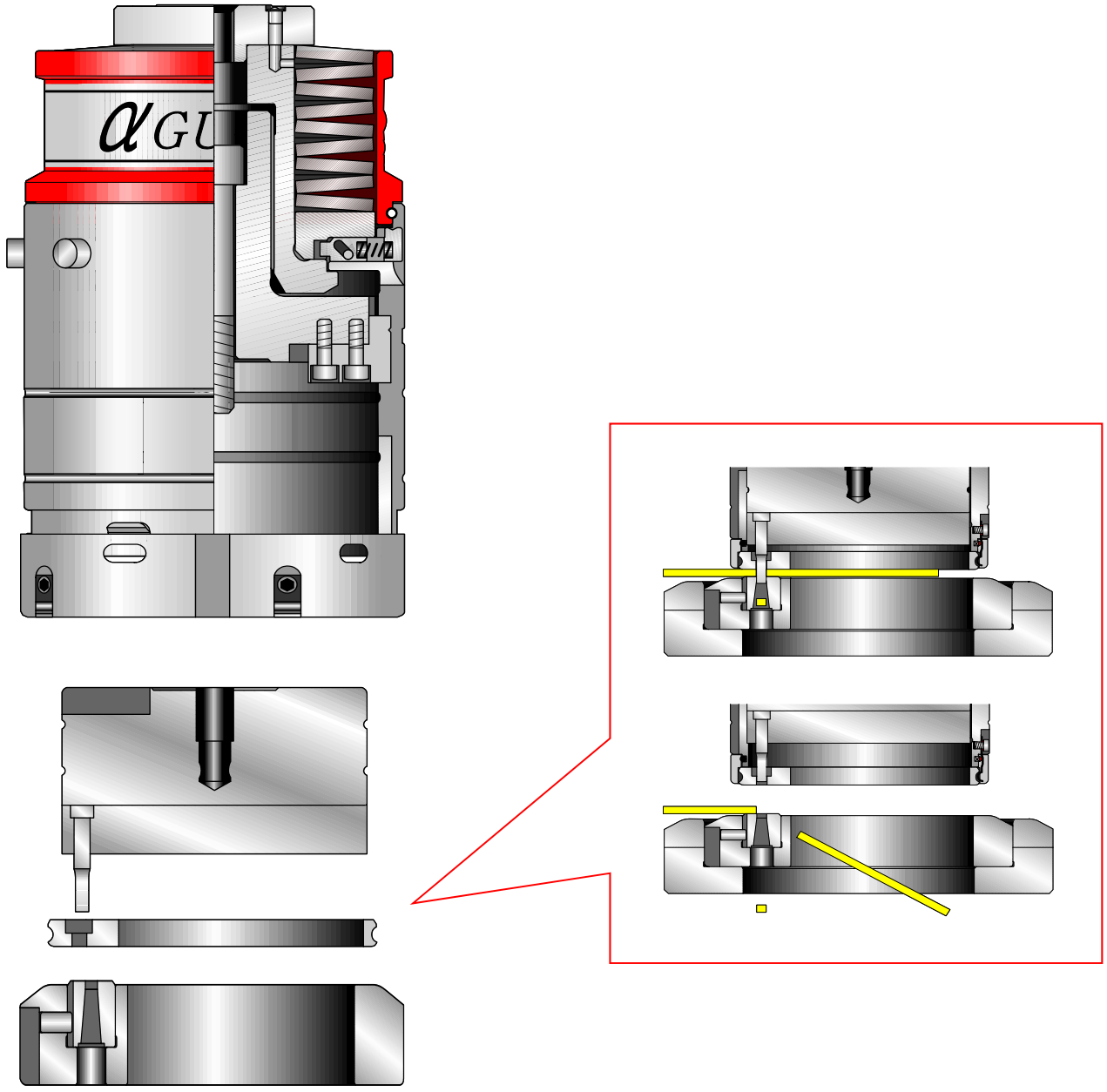


Inch Bend Tool Process Flow



10. Joint-less Processing for Small Piece Products

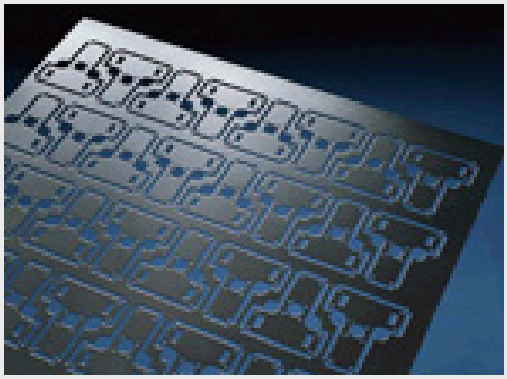
Work Chute Tool

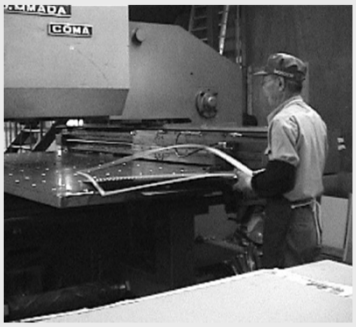


Joint Separating Work Issues

1. Multi-piece processing of small parts is fast,
   but separating work takes time.
2. A joining projection finish work by hand work is a large workload.

※Joining projection can not be removed by a deburring machine, so it is removed by hand work using a sander or a filing!





Solution

Work Chute Tool can separate products without any dedicated special tools. It brings non-finishing work, warp-less product, low cost and high quality!

Productivity!

NCT Work Only
No Hand Work
(Productivity Improvement)

Cost!

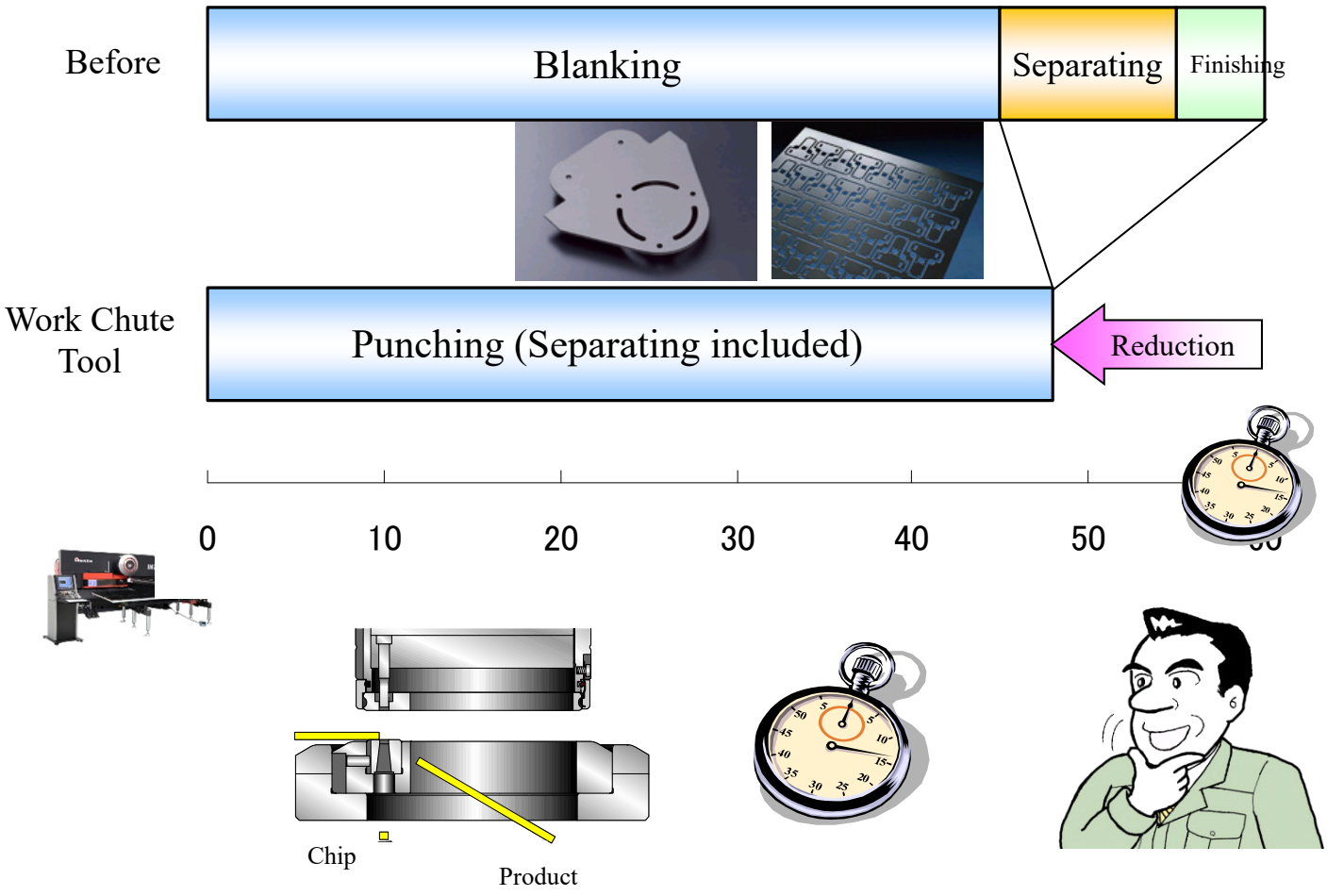
High Quality / High Productivity
(Profit Increase)

Quality!

No Warping
No Hand Work
(Defective Rate Reduction)

Case Example

Reference Data



Customer's Voice

▪Small parts having low manufacturing unit price can be produced by machine without requiring a large cost and labor now!

▪Small parts could not be picked up by a work chute unit, but this tool solved this issue.

▪Special tool caused a deformation on products by punching out. But this method reduced deformation and special tool costs!

Features

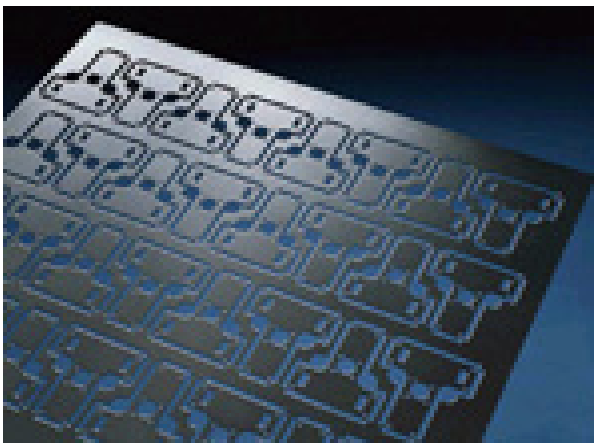
1.Joint separating work is automated by machine instead of hand work.

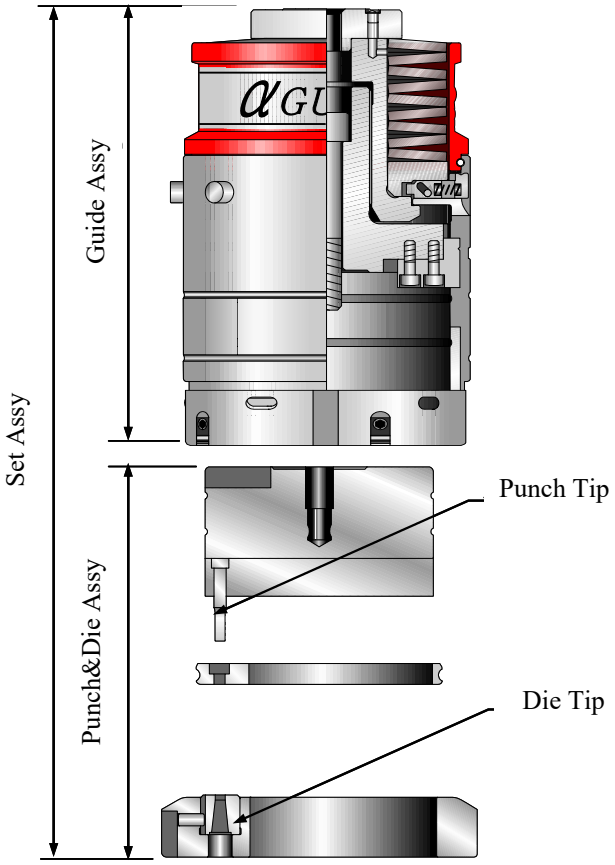
2.Post-processing for filing off joining projection is eliminated.

3.Special tools are not necessary, and products have no warp.

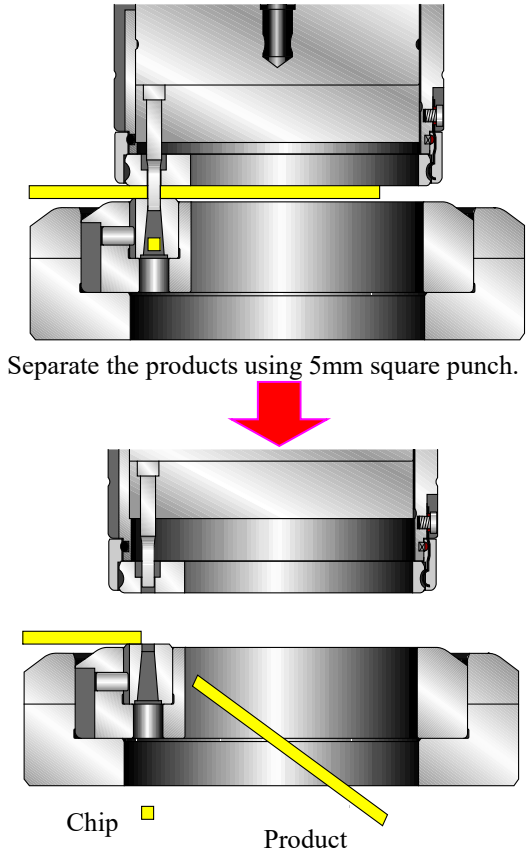
Specification

Tool Size	Dst:3-1/2”	Est:4-1/2”
Max. Product Size	63×63mm	81×81mm
Max. Thickness	Equal to Mild Steel 2.3mm	
Min. Thickness	Equal to Mild Steel 0.8mm	
Punch/Die Type	Tip Replacement Style	
Punch Size	5×5mm	
Applicable Guide	αGuide/Z Guide	





Punch size for joint cutting is 5mm square. ※Rectangle etc are also available.



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