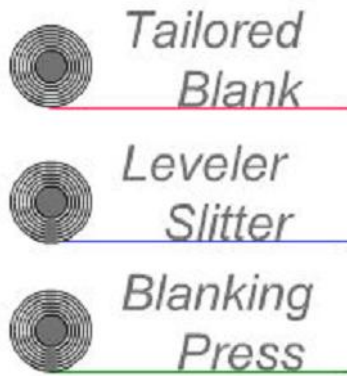


Toyo Kotetsu Co., Ltd.



Tailored Blank is a process of laser-welding two steel plates of different thicknesses. When special strength is required in one particular part, or especially when car manufacturers seek light-weighting or better yields of materials, this process is resorted to most these days.

Coil Blanking Press for reduction of processing costs. Let us present VE proposals based on our technology and know-how. New...we have started slitter processing of stainless steel.

Company profile

In what is the company engaged?

We cut 0.5 mm – 13 mm thin and medium iron plates vertically or horizontally, process them by punching them with dies and sell them. In April 2002, we introduced the Tailored Blank line, too.

Head Office Accounting Department

72 Minato, Urayasu-shi, Chiba Prefecture, Tel. 047-354-5888

Head Office Sales Department

72 Minato, Urayasu-shi, Chiba Prefecture, Tel. 047-354-5881

We do mostly over-the-counter selling.

Cold-rolled steel plates, acid cleaned steel plates, hot-rolled steel plates, surface-treated steel plates, steel plates for porcelain, various kinds of band steel, colored steel plates and other general steel materials

Head Office Factory

72 Minato, Urayasu-shi, Chiba Prefecture,

Tel. 047-354-5891

Tailored Blank processing

2–3 steel plates of different thicknesses are laser-welded.

Slitter processing

narrow slit coils are made.

Leveler processing

flat plates are made from coils.

Mini-leveler processing

plates are made from slit coils.

Shearing processing

Urayasu Factory

3-1-2 Tekko-dori, Urayasu-shi, Chiba Prefecture, Tel. 047-351-8151

Blanking Press Processing

steel plate coils are punched with molds

Founding

Founded April 24, 1951 (thanks to all of you, we celebrated the 50th anniversary in 2001)

Paid-in capital

45 million yen

Directors

Representative director and chairman

Saburo Murakami

Representative director and president

Kyoko Murakami

Managing director

Shuichi Jouhara

Plus three other directors

History

April 1951	Toyo Kotetsu Co., Ltd. was founded at 4-12-16 Kamesawa, Sumida-ku, Tokyo
September 1960	Warabi Factory was built at 2-3-12 Nishiki-cho, Warabi-shi, Saitama Prefecture, Processing machines such as leveler/shearing machines were installed
April 1969	Slitter Line was installed at Warabi Factory
April 1973	Factory No. 1 was constructed in Urayasu Iron & Steel Complex in Chiba Prefecture, Blanking Line was installed
December 1983	Head Office was moved to 72 Minato, Urayasu-shi. Head Office Building and Head Office Factory were built on this occasion
August 1995	Land adjacent to Head Office Factory was purchased and a new factory was built
December 1997	1500-ton press line was installed at Urayasu Factory
April 2001	Certification of ISO 9002 was acquired
April 2002	Tailored Blank Line was installed
April 2003	Certification of ISO 9001 was acquired
April 2004	New 800-ton Blanking Line was installed
June 2004	Tailored Blanking Machine No. 2 was installed
September 2004	Slitter processing of stainless steel started
July 2005	Processing of 610-mm inner diameter of slitter products became possible

Head Office Factory, Tailored Blank

Entry into Tailored Blanking!

High-performance and high-precision Blanking Press of Toyo Kotetsu and Tailored Blank Welding Line which aims at a new technical development in the 21st century



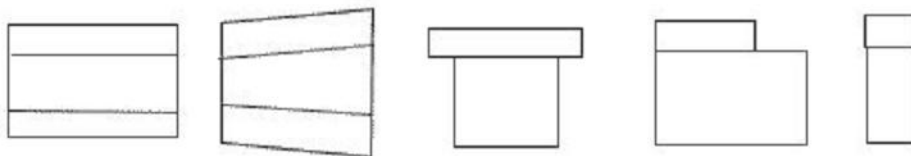
Equipped with state-of-the-art LD-YAG laser with high output of 4 kw		
	Machine No. 1	Machine No. 2
Plate thickness	0.6mm-2.3mm	0.6mm-2.3mm
Welding length	200mm-1800mm	150mm-1350mm
Product dimensions	Maximum 1800mm2500mm	Maximum 1650mm2500mm

An article about our laser processing appeared in the Chiba edition of Nihon Keizai Newspaper dated June 15.

Tailored Blank welds two steel plates of different thicknesses. This process is catching much attention recently for its light weight and improved yield. By combining laser welding with our years-old Blanking Press Processing, we aim to meet our users' satisfaction with high performance and high precision.

	Features of our Tailored Blank TWB
A	Products can be made light-weight.
B	Yield can be improved. Waste materials can be reduced.
C	Module formation can be promoted to reduce die/mold cost.
D	Consequently, cost reduction and quality improvement can be realized.
E	Steel plates of different materials can be welded. For example, plain steel plates + high-tensile steel plates
F	3-material welding (2-straight line welding) is possible.
G	Products can be dowel punched, so product lot can be stabilized high.

Our Tailored Blank Line is a general jig-type, and various materials can be welded such as one-axis straight line 2-piece welding (three-part welding). Please ask us about sample welding.



Urayasu Factory

At Urayasu Factory, Blanking Press processing is mostly done. Various products are produced by being punched. Uses include outside panels of passenger cars, driver's seats of trucks, electric appliances and many others. As punching is done with dies, even complicated processing can be done. By using drawing, square and rectangular iron plates can not be made into forms desired. But by punching the most appropriate irregular form, the most appropriate drawing can be achieved. This is Blanking Press. As we have been engaged in Blanking press processing for thirty years, we can offer VE proposals by using our technology and know-how.

We recommend Blanking Press to reduce processing cost.

Features of Blanking Press

- (A) Yield can be improved. For example, when products of the same shape are made, the yield for one-row punching is 72%, but it can be increased to 76% for 2-row punching and 89% for 3-row punching. The yield of coil blank is expected to be 5% better than that of sheet blank.
- (B) Labor saving of processing can be achieved. In the past, coils were made into sheets once and then each sheet was punched. Now several sheets can be punched directly from a coil.
- (C) Transportation freight becomes cheaper. Coils are made into Blank size in one breath. Extra scraps are all dropped off, and materials can be transported light.
- (D) Downgrading of materials becomes possible. In comparison with cases where sheets are forced to be punched, downgrading of steel plates (e.g. from special steel to plain steel) is possible by choosing the most appropriate Blank forms.
- (E) Inventory control is easy. As direct delivery to the press line is possible, inventory control is extremely easy, and storage space can be saved.

In the past, we specialized in thin plates, but by introducing a 1500-ton press, we can now handle up to 12.7 mm-thickness (half inch). Please contact us if you are repeating the same process or if you press each product one by one. We are glad to offer information or submit a quotation. Gap shearing of 13 mm is also possible.

Until products are made with our 1500-ton press (in the following Blanking Press, 7 products are made with one punching)



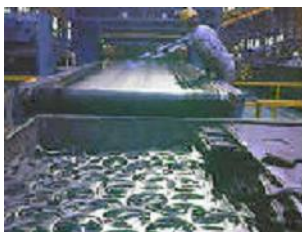
1500-ton Press Line



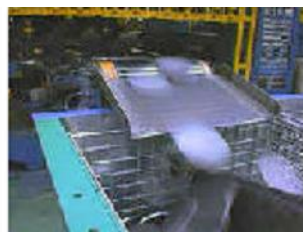
Press dies



Full-automatic line



Punched-out scraps



Finished products come out



Products (gouged-out)

Enquiries

Enquiries about accounting, personnel and general affairs
Soumu@toyo-kotetsu.co.jp

Accounting Department at Head Office

TEL 047-354-5888 FAX 047-354-6931

Enquiries and orders about retail products and processing
eigy@toyo-kotetsu.co.jp

Sales Department at Head Office

TEL 047-354-5881 FAX 047-354-5894

Technical enquiries about Tailored Blank/Slitter/Leveler/Mini-leveler
honshakojo@toyo-kotetsu.co.jp

Head Office Factory

TEL 047-354-5891 FAX 047-354-5894

Technical enquiries about Blanking Press
urayasukojo@toyo-kotetsu.co.jp

Urayasu Factory

TEL 047-351-8151 FAX 047-351-8154



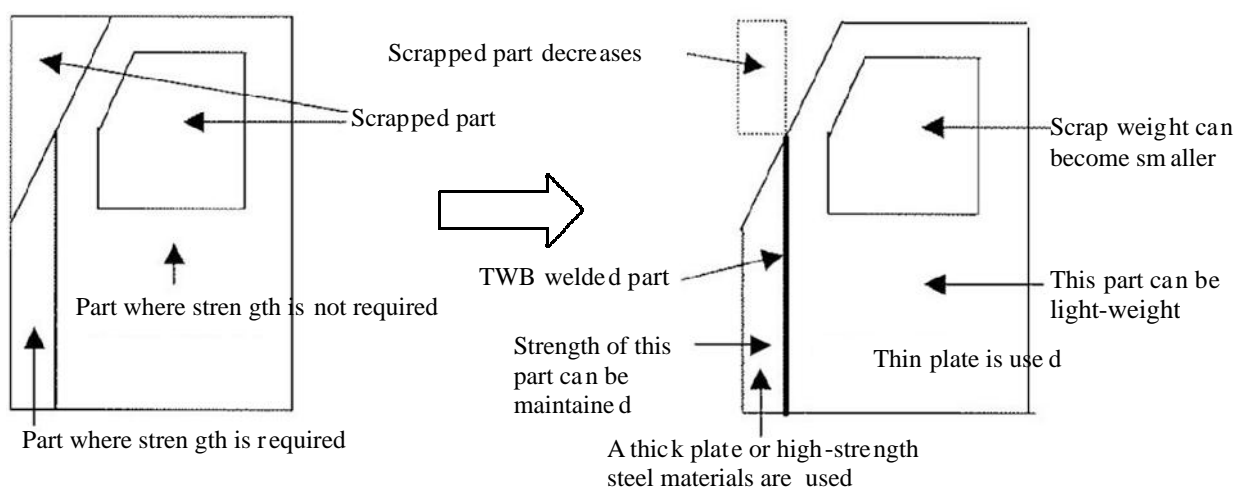
About Tailored Blank (TWB)

This process is getting the most attention from the automotive industry

Toyo Kotetsu Co., Ltd.

1. What is Tailored Blank?

In the design of passenger cars, the problem of fuel efficiency is important. Of course, light weight leads to fuel efficiency. But when safety is considered, thick steel plates must be used where strength is required or high-strength steel materials must be used. In Europe, however, instead of using high-strength steel materials, the technique of laser-welding plates of different thicknesses was developed. It is now known that welded plain steel plates have enough strength and this TWB process is now used for doors, side panels, floor pans, etc. By using TWB process, it became possible to make products lighter of weight, improve the yield of materials, promote mold formation and reduce cost.



In the past, a steel plate with a thickness for high-strength parts was used. Consequently, the product became heavier and the yield, worsened due to scrapped part, etc.

By using TWB process, products can be made considerably light-weight, and the yield of materials improves drastically. Mold formation is also promoted to reduce mold cost.

2. History of Tailored Blank

The current Tailored Blank process by laser-welding began to be adopted in the mid 1980s, expanded abruptly in the 1990s, and is still expanding at present. In the 1960s, Tailored Blank process by TIG arc welding started, and in the late 1970s, the mushroom process was adopted. But all of them had limited uses and did not become popular. With the development of a high-output laser oscillator, Tissen of Germany began to manufacture and supply laser-welded large materials for floor pans of Audi. In Japan, Toyota adopted it first, and later many companies adopted it actively.

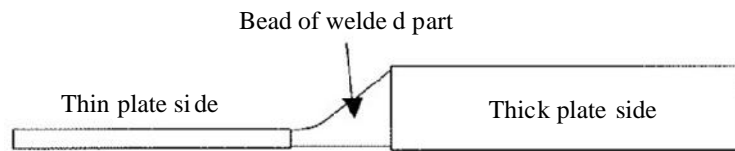
The laser oscillators use mostly CO₂ laser, but the high-output YAG laser was developed and is being used now. Our laser oscillators use this YAG (LD) laser.

3. Features of Tailored Blank TWB

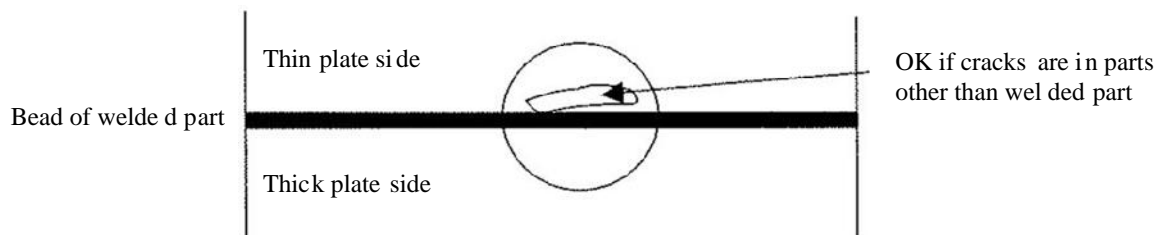
- (A) Products can be of lighter weight.
- (B) The yield can be improved. Waste materials can be reduced.
- (C) By pre-welding some materials, module formation can be promoted and mold cost can be reduced.
- (D) Consequently, cost reduction and quality improvement become possible. Even if Tailored Blank welding cost is added, cost reduction of materials leads to overall cost reduction.
- (E) Steel plates of different materials can be welded. (e.g. plain steel plate + high-tensile steel plate, cold-rolled steel plate + zinc-plated steel plate)
- (F) It is possible to weld 3 materials (2-straight line welding) where only the central part is made thick.
- (G) It is possible to dowel-punch the thin plate when materials of considerably different thicknesses are welded, so the product lot level can be stabilized.

4. Welded part of Tailored Blank TWB

- (A) Welded parts are inspected in various ways to keep the high quality of welded parts.
- (B) The shape sensor of bead inspection is installed in the processing head, and inspection is done at the same time.



- (C) Pinhole inspection is done with the above-mentioned bead inspection equipment. Machine No. 1 does pinhole inspection at the welding speed of 6 mpm, 2 mm pitch, and new Machine No. 2 at 0.3 mm pitch. New Machine No. 2 can also do monitor inspection from the reverse side. Even small pinholes can not be missed.
- (D) Erichsen inspection gives strong pressure to a welded part, performs a destruction test and checks strength.



- (E) To do high-quality welding, a high degree of straightness is required in the welded part of the materials. This straightness can not be achieved with a steel plate which is cut by leveler processing. This straightness can be achieved by straight blade cut processing of Blanking Press. We have 3 lines of this Blanking Press Line. The defective rate according to our quality inspections so far is less than 0.5%, and we have received no complaints from our customers. (Note: where base materials, which are cut by our Blanking Press, are used)

TWB Tailored Blank

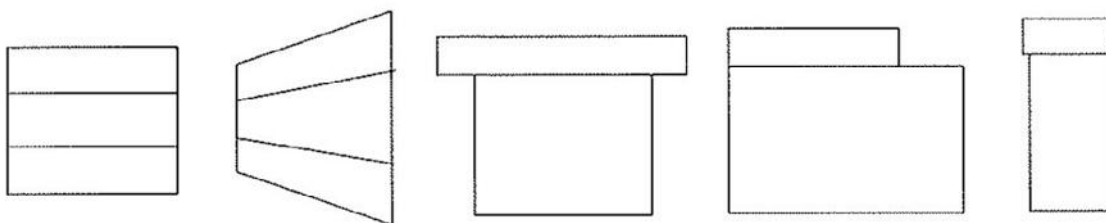
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Toyo Kotetsu Co., Ltd.

Tailored Blank is currently getting the most attention for light-weighting of materials and improvement of yield.

Specifications	Tailored Blank Machine No. 1
Plate thickness Welded materials of different thicknesses Welded materials of same thickness	Minimum 0.6 mm, Maximum 2.3 mm, Minimum 0.8 mm, Maximum 2.3 mm
Length Thick plate side Thin plate side	300-700 mm 300-1800 mm
Welding length	Minimum 200 mm, Maximum 1800 mm
Laser oscillator	YAG laser oscillator made by Mitsubishi Electric
Output	4 KW
Processing head	2 units
Processing station	2 processing stations
Welding speed	5-7 m/min
Production tact	15-20 seconds/work (in case of one process welding)
Automation	Line automatic operation except when changing input/output stacks
Accessory equipment	Equipped with welding quality full-automatic on-line inspection equipment, equipped with dowel-punch equipment

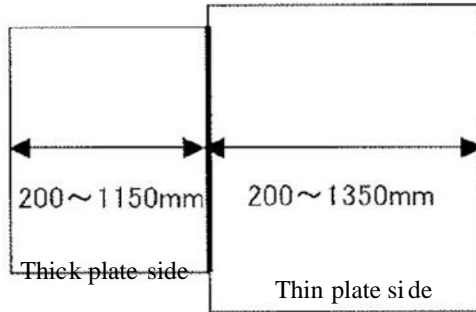
Specifications	Tailored Blank Machine No. 2
Plate thickness Welded materials of different thicknesses Welded materials of same thickness	Minimum 0.6 mm, Maximum 2.3 mm, Minimum 0.8 mm, Maximum 2.3 mm
Length Thick plate side Thin plate side	200-1150 mm 200-1350 mm
Welding length	Minimum 150 mm, Maximum 1650 mm
Laser oscillator	YAG laser oscillator made by Mitsubishi Electric
Output	4.5 KW
Processing head	2 units
Processing station	2 processing stations
Welding speed	5-10 m/min
Production time	15-20 seconds/work (in case of one process welding)
Automation	Line automatic operation except when changing input/output stacks
Accessory equipment	Equipped with welding quality full-automatic on-line inspection equipment, equipped with dowel-punch equipment



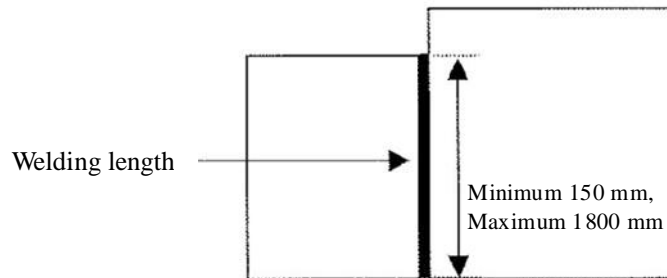
Our Tailored Blank Line is a general-purpose jig type, and can weld a variety of materials such as one-axis straight line 2-piece welding (3-part welding).

Characteristics of our T WB processing

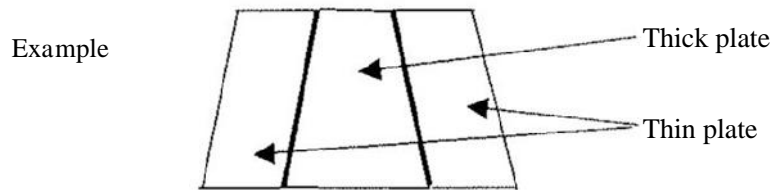
- (A) We can handle 0.6 mm -2.3 mm thickness. If steel plates of the same thickness are to be welded, we can handle from 0.8 mm.
- (B) We can handle 200 -1150 mm for the thick plate side, and 200-1350 mm for the thin plate side.



- (C) The welding length is 150 mm minimum and 1800 mm maximum.



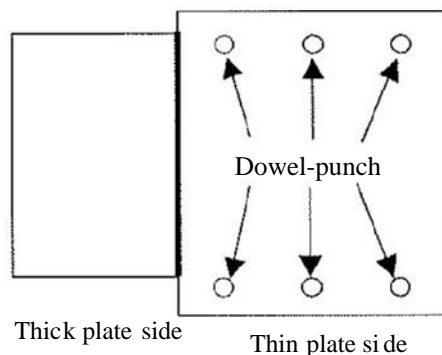
- (D) 3 parts (2-piece straight line welding) can be welded.



- (E) We are equipped with fully-automatic on-line inspection equipment, and offer high-quality products by doing various inspections. By doing bead inspection, pinhole inspection (Machine No. 1 at 2 mm pitch, and No. 2 at 0.3 mm pitch. Monitoring of reverse side is also possible) and Erichsen inspection, our defective rate is less than 0.5%, and there are no complaints from our customers.

- (F) We are equipped with Dowel-punch equipment

When the thin plate side is Dowel-punched to get bumps and dents and when products are piled up, adjustment is made so that there is not much of a difference from the thick plate side.



- (G) In addition to 2 lines, we are working in two shifts to cope immediately with emergencies.
- (H) It depends on the welding length, but we can process about 40,000 sheets a month with one line and in two shifts.

Characteristics of our processing

Toyo Kotetsu Co., Ltd.

Not only Leveler, Slitter, Mini-Leveler and Shearing, but Blanking Press and Tailored Blank can be done throughout.

Blanking Press

- | Having been engaged in Blanking Press work for thirty years, we are confident of our high technology and quality.
- | About 30% of our whole processing work is accounted for by the processing of outside plates which are subject to very strict inspection standards. (about 1200 tons a month)
- | On the basis of our experiences of many years, our engineers present proposals for cost reduction.
- | With three lines of 500 tons, 800 tons and 1500 tons, we handle various forms.
- | Blanking press can be applied to plate thickness of 0.6-12.7 (half inch)
- | With our 1500-ton press, Blanking can be applied to even high-tensile steel plates.

Tailored Blank

- | Being equipped with fully-automatic on-line inspection equipment (bead shape inspection/pinhole inspection), we do destruction testing with Erichsen equipment and offer high-quality products. Our defective rate according to our quality inspections so far is less than 0.5%, and we have received no complaints from our customers. (Note: where base materials, which are cut with our Blanking Press, are used.)
- | With our 2-line and 2-shift system, we cope immediately with emergencies of automotive manufacturers.
- | Base materials of Tailored Blanking require a high degree of straightness in the welded part. The straightness, which can not be achieved with a leveler, can be achieved with our Blanking Press cutting. We have 3 Blanking Press Lines.
- | High-tensile steel plates can be welded, too. (Welding of high-tensile steel plates and plate in steel plates can be done.)

Slitter

- | No complaints so far. We are confident of our high quality.
- | We can handle up to 0.3 -3.2 mm of thickness.
- | We can process high-tensile steel plates up to 1000-kg steel.
- | Our line is equipped with a non-oil belt bridle, so stainless steel processing can be done, too.

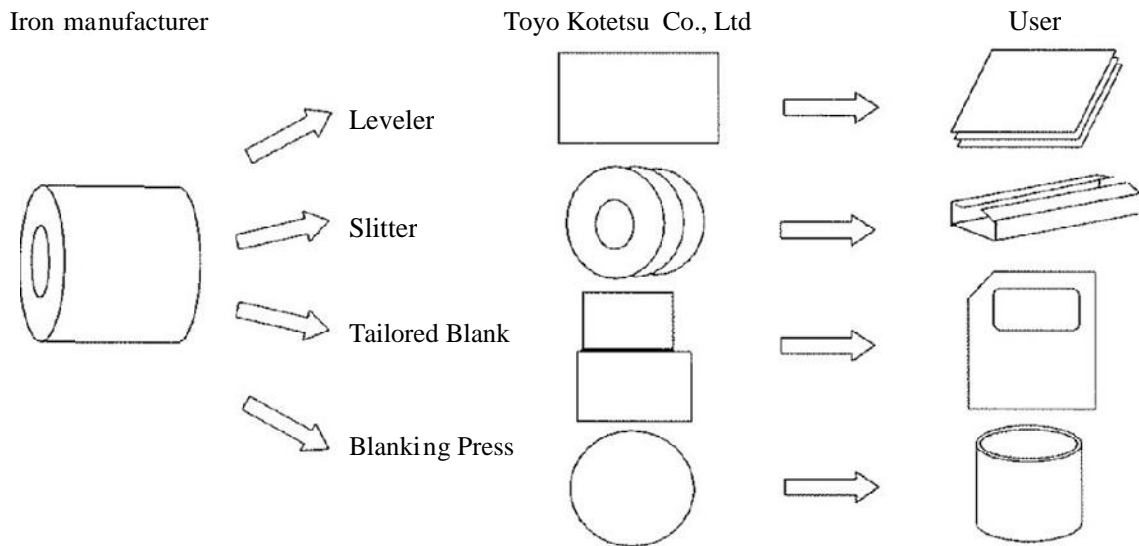
About Blanking Press

We recommend Blanking Press to reduce processing cost.

Toyo Kotetsu Co., Ltd.

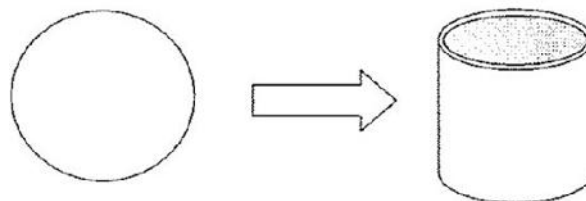
1. Foreword

Toyo Kotetsu Co., Ltd. has the Head Office Factory (Leveler cut line, Slitter line, Mini-Leveler cut line, Shearing, Tailored Blank) and the Urayasu Factory (Blanking Press line, Thick plate shearing). The parent coils supplied by iron manufacturers are flat-cut by the leveler cut line, split-coiled by the slitter line, laser-welded into different thicknesses by Tailored Blank and processed by the Blanking Press line. We make and supply products of different shapes as ordered by our customers.



2. Blanking Press

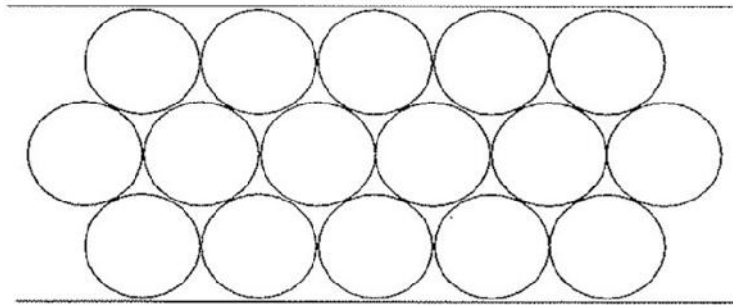
Around us, we see many things which are formed of iron. The forming of all of them is done with drawing press machines. And the original plate of forming is done from one iron plate. It depends on the drawing, but square iron plates or rectangular iron plates can not make shapes as desired. The most appropriate drawn shape can be made by punching the most appropriate irregular shapes. This is the Blanking Press.



3. Features of the Blanking Press

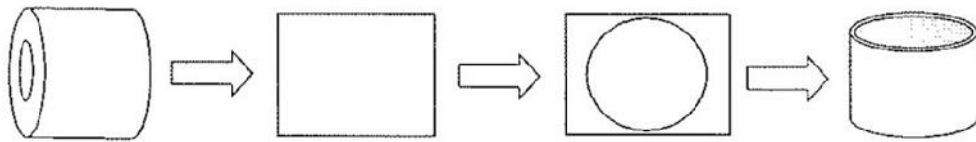
(A) The yield can be improved.

In the following processing, for example, the yield is 72% for one-row punching, but it can be increased to 76% for two-row punching and 89% for three-row punching.

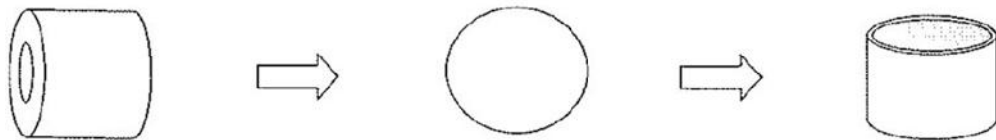


(B) Labor saving of processes can be achieved.

Conventional



Blanking Press



(C) Labor costs can be reduced.

The forged products, which are made one by one by hand, can be made several at a time by Blanking, thus eliminating the labor cost which has been required so far.

(D) Transportation costs are cheaper.

Coils are made into Blank size in one breath. All extra scraps drop off, and materials can be transported at low cost.

(E) Downgrading of materials is possible.

In comparison with cases where sheets and special steel are pressed, the downgrading of steel plates is possible by choosing the most appropriate Blank shape.

(F) Inventory control is easier.

As direct delivery to the press line is possible, inventory control is much easier and little storage space is required.

New 800 -ton Blanking Press

Toyo Kotetsu Co., Ltd.

Features

- 1 High-tensile steel plates can be cut. (But width is restricted)
- 1 Up to 4500 mm of product length can be handled, so large things can be cut. (e. g. side panels of vans can be one-piece cut)
- 1 The size of the bed is 4200 mm, so shapes can be designed freely. We can meet almost all shapes demanded by the car manufacturers of Japan.
- 1 Feed rolls etc. are matte-finished, so stop marks (slip marks) do not appear. Anti-back roll/major roll (lower side) are also matte-finished.
- 1 Therefore, suitable for outside plates.
- 1 About 30% of our whole processing work is accounted for by the processing of outside panels which are subjected to strict inspection standards (about 1200 tons a month).

Specifications	New 800-ton Blanking Press	Old 800-ton
Plate thickness	0.6-2.3 (3.2) mm	
Plate width	300-2000 mm	
Inner diameter of coil	508 mm, 610 mm, 762 mm	
Outer diameter of coil	800-2000 mm	
Maximum weight of coil	20000 kg	
Size of bed	Width 2500 mm x Length 4200 mm	Length 3700 mm
Feed speed	Max 162 m / min	
Frequency of punching	20-80 PM	
Feed length	100-4500 mm	-3500
Set height	900-1200 mm	
Pass line	700 and 400 (riser 300) adjustable by 100 upward and downward	700 and 400

1500-ton Blanking Press

Toyo Kotetsu Co., Ltd.

Features

- | We can handle plate thicknesses up to 12.7 mm (half inch)
- | As the punching load is big, high-tensile steel plates (100-kg steel) can be processed
- | From round bars of special steel, drawn products were cut one by one. But now 7-13 pieces can be punched from a coil.
- | In the case where special steel is used for fear of ageing, it can be downgraded to plain steel.
- | Various formed parts can be handled, realizing cost reduction.
- | From the conventional sheet blank, coil blank is possible.
- | 300 mm riser (stand) is installed, so various shapes can be handled.
- | Actual results of processing: gears/pistons/cores of generators/axle housing of station wagons/air brake tanks, etc.

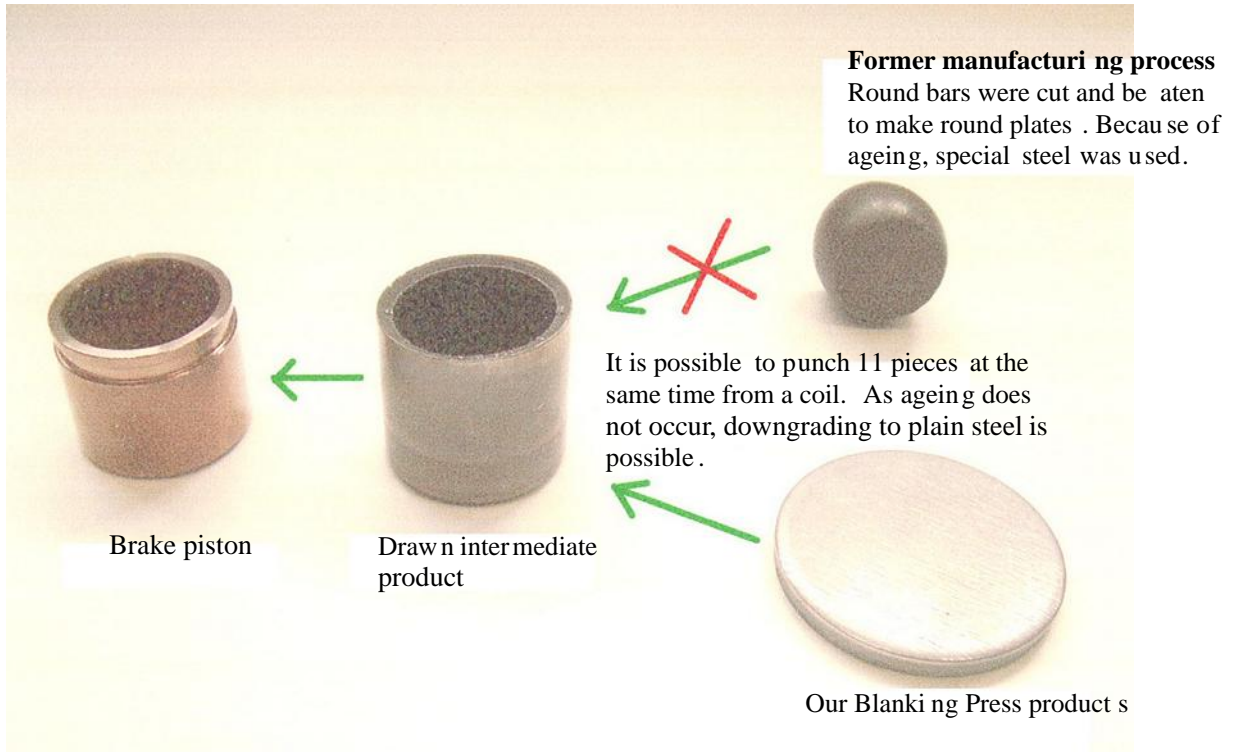
Specifications	1500-ton Blanking Press
Plate thickness	1.0 mm-12.7 mm (half inch)
Plate width	300-2000 mm
Inner diameter of coil	508 mm (20 inches), 610 mm (24 inches), 762 mm (30 inches)
Outer diameter of coil	1000-2000 mm
Maximum weight of coil	30000 kg
Size of bed	Width 2500 mm x Length 3700 mm
Feed speed	Max 120 m / min
Frequency of punching	10 SPM-80 SPM
Feed length	100-3500 mm
Set height	900-1200 mm



This machine is the 1500 ton blanking press. It can cut thick steel plates. The thickness of the plate is up to a half inch.

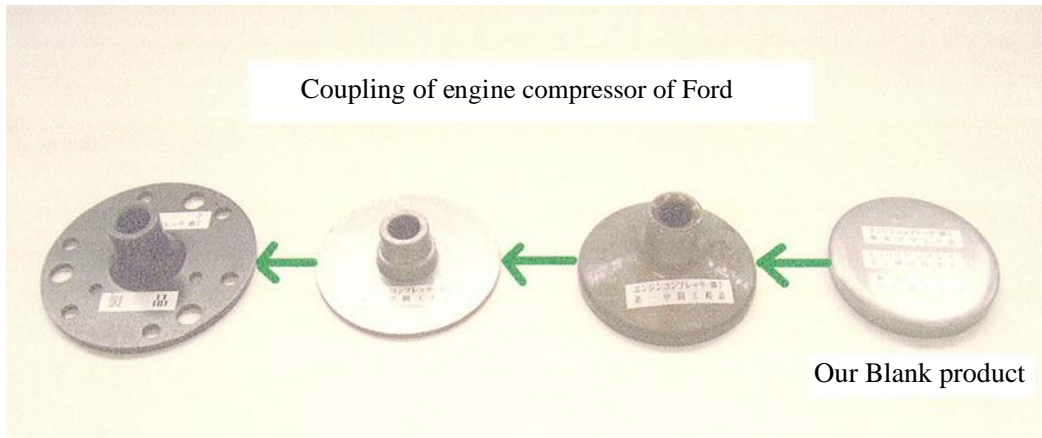
This is the only machine of their kind in the KAN TO area.



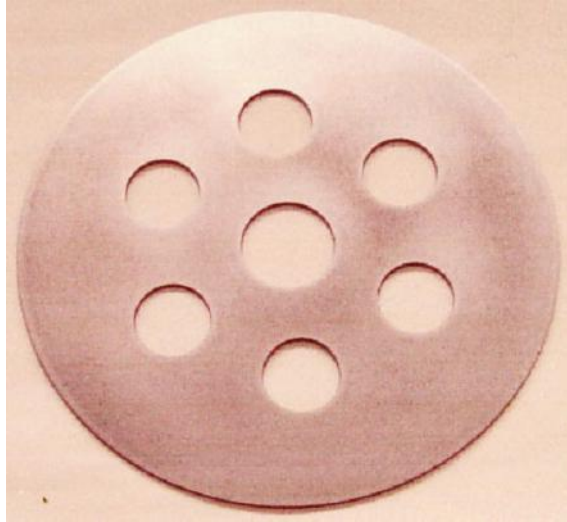


Up until now, the pieces used for making brake pistons were made by pressing solid metal into flat discs. Now, our factory mechanically creates these same flat discs much more quickly and efficiently. The 1500 ton blanking press can create 11 discs at one time instantly.





This is the engine compressor part of a Ford car. This same machine can produce the disc needed by this part at the speed of 13 at a time.



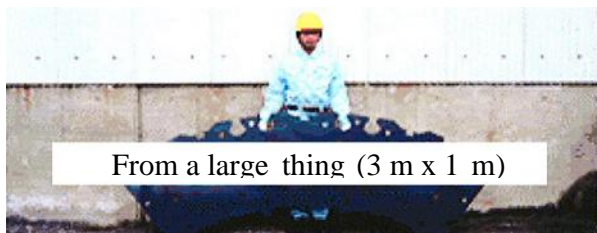
Gear of an industrial machine

This is the transmission plate of a wheel loader. Up until now, the cutting machine by laser created this plate piece by piece. But now our factory can create many plates at one time using the 1500 ton blanking press.

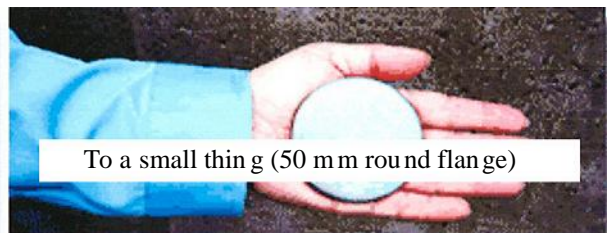
Actual results of thick products made using 1500-ton press

- | Yoke plate of a generator at a hydraulic power station (core plate)
Steel plate for magnetic pole PC YH400/thickness 2.3 x width 1m x length 3m,
For hydraulic power station in Taian, China
- | Flange (coupling of cooler parts of cars, etc.)
Acid cleaning SPHC-P/thickness 8mm x diameter 70 round punched/simultaneous punching of 13 pieces
- ? Engine piston
Acid cleaning SPHC-P/thickness 8 mm x diameter 77 round punched/simultaneous punching of 11 pieces
- | Rear axle housing (automotive parts)
High-tensile steel plate 60-kg steel/thickness 5.6 mm x 1520 x 200/alternate punching of upper and lower sides
- | Automatic transmission parts for large industrial machines
High carbon steel S55C/thickness 6.25 mm x diameter 430 ring-punched

Coil Blanking Press of thick products for cost reduction



From a large thing (3 m x 1 m)



To a small thing (50 mm round flange)

Simultaneous punching of 13 pieces

By using 1500-ton coil Blanking Press for thick products

1. The yield can be improved (from sheets to coils)
2. As aging does not occur, downgrading of materials is possible
3. Large volume production in a short period of time is possible
4. As the punching load is big, 12.7 mm or high-tensile steel plates can be processed

Please feel free to contact us! ISO9001



Toyo Kotetsu Co., Ltd.,
Sales Department, Tel. 047-354-5881

<http://www.toyo-koutetsu.co.jp/>