

Your Best Partner
TOTAL PRESS MANUFACTURER
of
PRESS AND AUTOMATION EQUIPMENT



H&F Corporation

Press shop total coordinator

H&F Corporation was established July 1st 1999 to consolidate the press division of Hitachi Zosen Corporation and Fukui Machinery Co., LTD.

As the result of this consolidation, H&F Corporation constructed the integrated system from manufacturing of super large size press, medium size press and factory automation system to after sales service and supplies machines and equipments in the whole press shop as Total Press Manufacturer.

Under ISO9001 in 1996 and ISO14001 in 2004 certified, and winning Award for TPM Excellence, 1st Category and Award for Excellence in Consistent TPM Commitment, 1st Category, H&F Corporation supplies higher quality products and responds to stringent customer needs.



Servo tandem press line



Servo transfer press



Servo blanking press line



Servo trial press



Tandem press line



Transfer press



Blanking press line



Trial press



Destack sheet feeder



Panel transfer system



Auto palletizer



Coil feeder



Piler



Trapezoid shear (Suspend type)



Laser blanking line

Servo tandem press line

High speed and Stable

Maximum speed for all servo tandem press line is 18min⁻¹. Originally developed Hexa feeder system achieves high speed and stable panel transfer.

Low cost

H&F manufactures various lines according to customer needs, such as cost effective hybrid servo tandem line with No.1 servo press and No.2 to No.4 mechanical presses.

Servo die cushion

Highly accurate and durable rack and pinion direct servo die cushion has feature such as drawing quality improvement, production noise reduction, energy saving and maintenance cost saving.

Peak cut device

To reduce power capacity for servo press, peak cut device is equipped.

Integrated manufacturing system

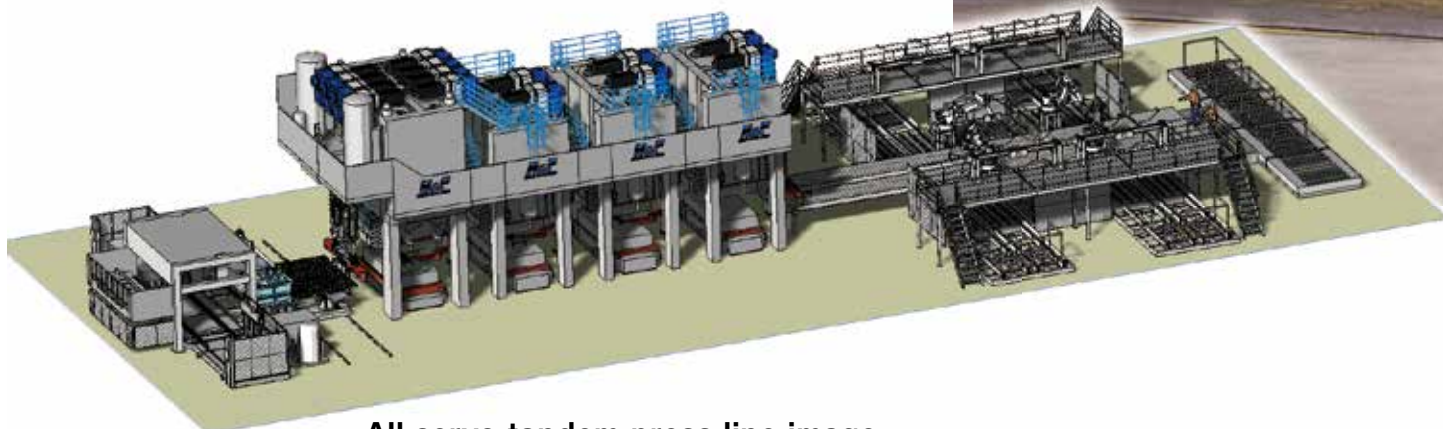
All machines in the line such as servo presses, destack sheet feeder, panel transfer system between presses and auto palletizer are designed and manufactured in H&F.

Thus the tandem press lines with excellent operability and maintainability as a line are delivered to the customers.

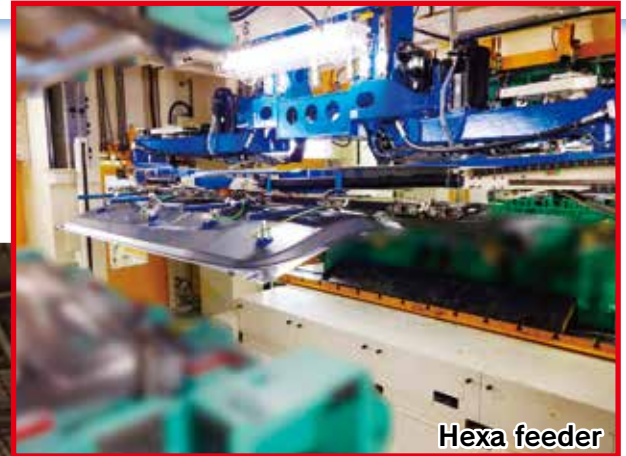
Servo tandem press line typical specification

	General hybrid	High speed hybrid	General all servo	High speed all servo
Press type	MFES15000	MFES15000	MFES23000	MFES23000
	MFE10000x3	MFE10000x3	MFES12000x2 MFES10000	MFES12000x2 MFES10000
Press capacity [kN]	15000(Servo)	15000(Servo)	23000(Servo)	23000(Servo)
	10000(Mechanical)	10000(Mechanical)	12000(Servo) 10000(Servo)	12000(Servo) 10000(Servo)
Line speed [min ⁻¹]	~ 12	~ 15	~ 14	~ 18
Bolster size [mm]	4500 x 2200	4500 x 2200	5000 x 2500	4500 x 2200
Die cushion capacity [kN]	300(Servo, No.1)	300(Servo, No.1)	400(Servo, No.1)	400(Servo, No.1)
Panel transfer system	6 axis robot + Rotate hand	Hexa feeder	6 axis robot + Double slider	Hexa feeder
Max. panel size [mm]	Single:4000 x 1900	Single:4000 x 1900	Single:4160 x 1900	Single:4000 x 1900
	Double:1800 x 1900	Double:1800 x 1900	Double:2000 x 1900	Double:1800 x 1900

MFES23000 Hybrid servo tandem press line



All servo tandem press line image



Servo die cushion

Improving drawing quality

- For deep draw
- For over shoot draw

Material cost reduction

- Less expensive material may be used due to improved drawability.
- Improving yield rate

Energy saving

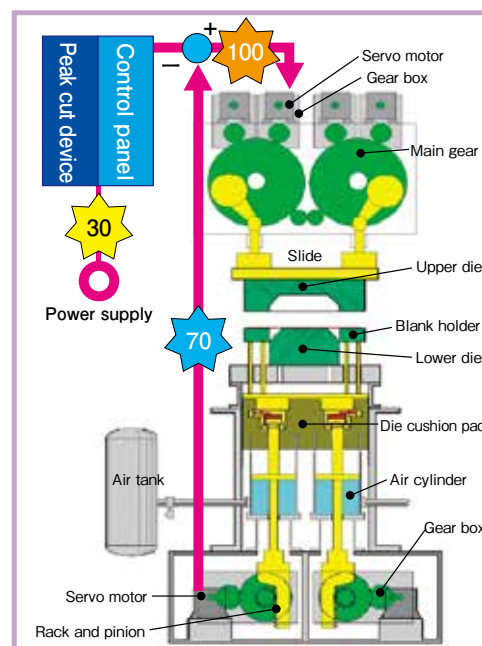
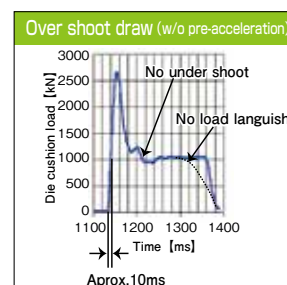
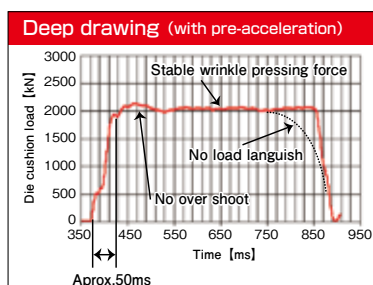
70% of die cushion energy will be recovered and reused.
(H&F measured value)

Low noise

Using pre-acceleration function to lower the die cushion just before the slide and the blank holder touches, the die touching noise can be reduced approximately 25dB(A).
(compared to air die cushion)

Simple

Direct drive structure with rack and pinion simplifies the mechanism, high speed response, high accuracy and long life are achieved.



Energy recovery of servo die cushion



15000kN Servo tandem press line with servo die cushion



23000kN Servo tandem press line with servo die cushion

Tandem press line

Flexible

Tandem press line with 6 axis robots panel transfer system enables flexible production pattern according to customers' request.

Excellent line operability

Total line control is designed and manufactures by H&F and enables excellent line operability. Optional position monitoring control system can easily optimize line production speed.

MFL24000 Tandem press line



Tandem press line typical specification

Press type	MFL24000 MFE10000x3
Press capacity [kN]	24000(Link) 10000
Line speed [min ⁻¹]	~12
Bolster size [mm]	4600 x 2500
Die cushion capacity [kN]	4000(Air, No.1)
Panel transfer system	6 axis robot + rotate hand
Max. panel size [mm]	Single:4100 x 2200 Double:1700 x 2200
Centering unit	Yes(Mechanical)
Washing unit	Yes(Evacuation type)

OSL8000 Tandem press line



Tandem press line typical specification

Press type	OSL8000 OSE6000 OSE4000x2
Press capacity [kN]	8000(Link) 6000 4000
Line speed [min ⁻¹]	~ 13
Bolster size [mm]	3000 x 1700
Die cushion capacity [kN]	1200(Air, No.1)
Panel transfer system	6 axis robot + sub arm
Max. panel size [mm]	Single:2800 x 1600 Double:1600 x 1600
Centering unit	—
Washing unit	—

Automation equipment for tandem press line

Destack sheet feeder

6 axis robot system enables to adapt various customer request.

Also high speed electro magnet belt type destack sheet feeder for high speed tandem press line and vision type for aluminum are manufactured.

Destack sheet feeder for tandem press line



Destack sheet feeder for tandem press line typical specification

Transfer system	6 axis robot
Speed [min ⁻¹]	~ 14
Max. panel size [mm]	Single:4100 x 2200 Double:1700 x 2200
Max. panel weight [kg]	40
Number of stack	2
Centering unit	Yes(Mechanical)
Washing unit	Yes(Evacuation type)

Panel transfer system between presses(6 axis robot)

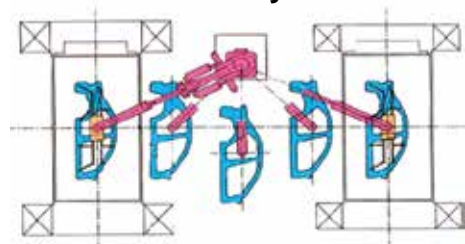
6 axis robot with rotate hand for panel transfer system between presses enables parallel panel transfer and 90 degree rotation.

Newly developed double slider enables faster panel transfer.

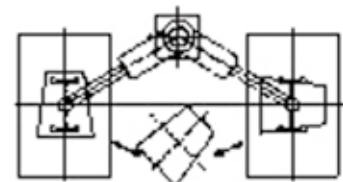
Rotate hand



Parallel transfer by rotate hand



90° rotation by rotate hand



Panel transfer system between presses (6 axis robot) typical specification

panel transfer system	6 axis robot+ rotate hand	6 axis robot+ double slider
Speed [min ⁻¹]	~ 12	~ 14
Press distance [mm]	6300 ~ 9000	5200 ~ 6300
Payload[kg]	100 (including arm and cross bar)	100 (including arm and cross bar)

Double slider

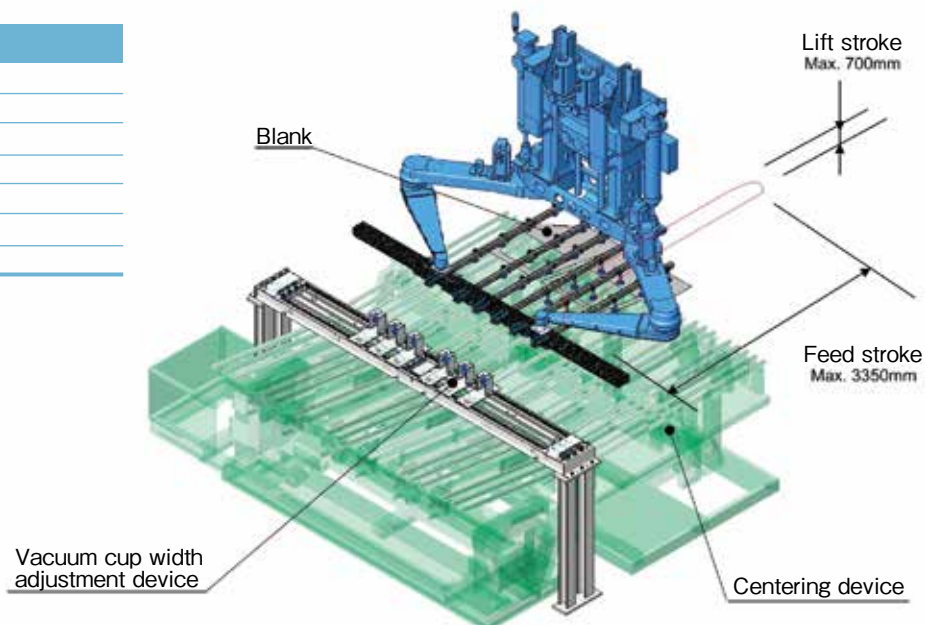


Hexa loader

- Vacuum cup arm width individually adjustable automatically
- All vacuum cups on/off selectable
- Minimizing vibration in production using CFRP vacuum cup arm

Hexa loader typical specification

Feed stroke [mm]	~ 3350
Lift stroke [mm]	~ 700
Speed [min ⁻¹]	~ 18
Max. panel weight [kg]	40
Vacuum cup arm [pcs]	6 (CFRP)
Vacuum cup width adjustment	Auto
Vacuum cup [pcs]	24

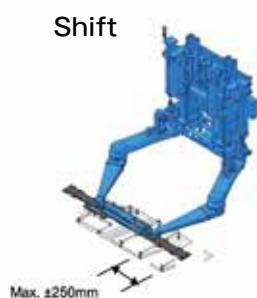
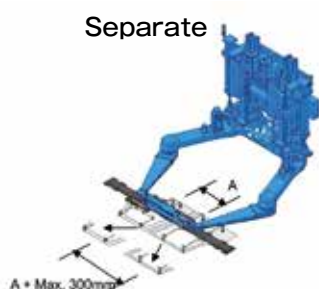
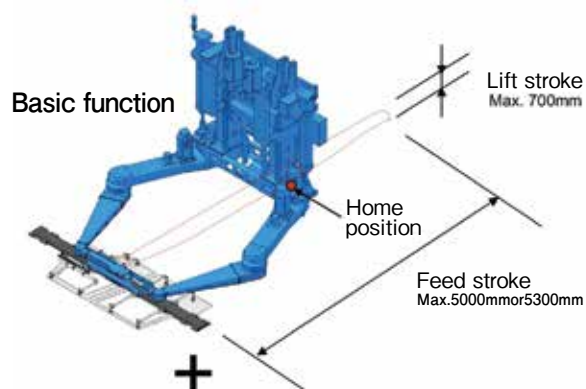


Hexa feeder

- Hexa feeder panel transfer system between presses achieves maximum 18min⁻¹ high speed and stable panel transfer.
- Teaching operation of hexa feeder is easy as familiar robot system.
- In addition to basic feed and lift function, separate, shift, tilt and rotate function are possible.
- 90 degree rotate and off set function is possible by λ arm hexa unloader.

Hexa feeder typical specification

	Short reach	Long reach
Feed stroke [mm]	5000	5300
Lift stroke [mm]	~ 700	~ 700
Speed [min ⁻¹]	~ 18	~ 18
Max. panel weight [kg]	100 (Including arm, cross bar)	120 (Including arm, cross bar)
Separate [mm]	~ 300	~ 300
Shift [mm]	~ ± 250	~ ± 250
Tilt [deg]	~ ± 15	~ ± 15
Rotate [deg], Off set [mm]	± 90 , ± 1250	—



Automation equipment for tandem press line

Auto palletizer(Vision system)

High speed

Maximum 18min^{-1} , high speed palletizing is possible to adapt from large size cross bar cup feed transfer press to high speed all servo tandem press line.

Vision system

Vision system(Vision sensor(Camera) detects panel position on the exit conveyor and robots pickup panels automatically correcting the position) has following features.

- (1) As panel inspection conveyor can be run continuously, inspectors can inspect all panels on the conveyor safely.
- (2) No positioning necessary when robots pickup panels, setting up time can be reduced.

Auto palletizer(Vision system)



Auto palletizer typical specification

Pick up robot [pcs]	2
Palletize robot [pcs]	2
Max. panel weight [kg]	125(Including arm, attachment)
Speed [min^{-1}]	~ 15
ATC	Yes

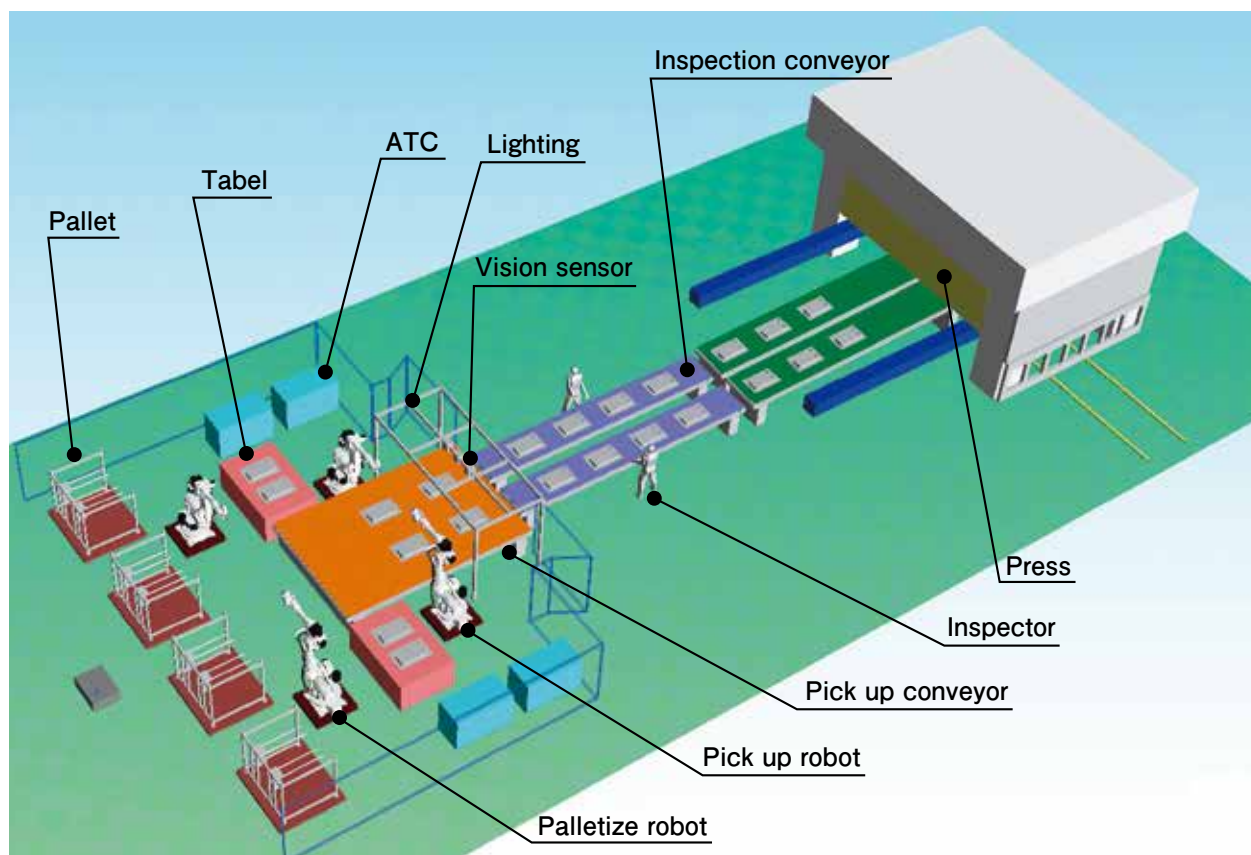
Auto palletizer (Vision system) for high speed tandem press line



Auto palletizer typical specification

Pick up robot [pcs]	4
Palletize robot [pcs]	—
Max. panel weight [kg]	125(Including arm, attachment)
Speed [min^{-1}]	~ 18
ATC	Yes

Auto palletizer(Vision system) image



Loading pattern

No.	Number of Robot(pcs)	Panel size (mm)	Palletizing speed (min ⁻¹)	Layout	Stowage pattern				
					Flat	Skewer	Shelf	Lean	Hang @ longer conveyor
1	2+2	1500×1400	14		○	○	○	○	
2	4	3800×1800	18		○	○			
3	4	3800×1800	15		○	○	○	○	
4	2	3750×1750	11		○	○	○	○	○

Transfer press

Wide variation

From 8000kN to largest class 35000kN for high-strength steel transfer press are lined up.
Not only crankless but also link and servo press are selectable.
Transfer press for aluminum is also available.

Linear motor driven

Linear motor for feed axis enables reduction of moving parts and as a result, maximum 32 min⁻¹ smooth and stable production can be achieved.
Driving mechanism simplification enables reducing noise and improving maintainability.

Various transfer pattern

Not only finger tri-axis transfer motion, but also vacuum cup vertical di-axis transfer motion and so on can be integrated.



Feed axis linear motor



Cup feeder and vacuum conveyor for aluminum transfer

TFES20000 Servo transfer press



Servo transfer press typical specification

Press type	TFES20000
Press capacity [kN]	20000(Servo)
Press speed [min ⁻¹]	~ 30
Bolster size [mm]	6300 x 2300
Die cushion capacity [kN]	1000(Air, 1st)
Transfer device	Servo motor driven(Linear motor for feed axis)
Feed stroke [mm]	750、900、1200、1500
Lift stroke [mm]	100、150、200
Clamp stroke [mm]	250
Max. panel size [mm]	1800 x 1100

TFE15000 Transfer press



Transfer press typical specification

Press type	TFE15000
Press capacity [kN]	15000
Press speed [min ⁻¹]	~ 32
Bolster size [mm]	5500 x 2200
Die cushion capacity [kN]	1200(Air, 1st)
Transfer device	Servo motor driven(Linear motor for feed axis)
Feed stroke [mm]	900, 1100
Lift stroke [mm]	100, 150, 200, 250
Clamp stroke [mm]	200, 250, 300
Max. panel size [mm]	1600 x 700

TFE30000 Transfer press for aluminum & steel



Transfer press for aluminum & steel typical specification

Press type	TFE30000
Press capacity [kN]	30000
Press speed [min ⁻¹]	~ 30(Aluminum ~ 25)
Bolster size [mm]	6250 x 2300
Die cushion capacity [kN]	1500(Air, 1st)
Transfer device	Servo motor driven(Linear motor for feed axis)
Feed stroke [mm]	750, 1000, 1200
Lift stroke [mm]	150, 200, 250
Clamp stroke [mm]	250, 300
Max. panel size [mm]	1700 x 800

TFL35000 Link transfer press



Link transfer press typical specification

Press type	TFL35000
Press capacity [kN]	35000(Link)
Press speed [min ⁻¹]	~ 26
Bolster size [mm]	6150 x 2300
Die cushion capacity [kN]	1800(Air, 1st)
Transfer device	Servo motor driven(Linear motor for feed axis)
Feed stroke [mm]	1200, 1500
Lift stroke [mm]	200, 225, 250
Clamp stroke [mm]	200, 225, 250
Max. panel size [mm]	Single : 2000 x 1200 Double : 2000 x 525

Blanking press line

Wide variation

Blanking press lines for outer parts, inner parts and high-strength steel are lined up. Servo, link, crank and crankless blanking press are available.

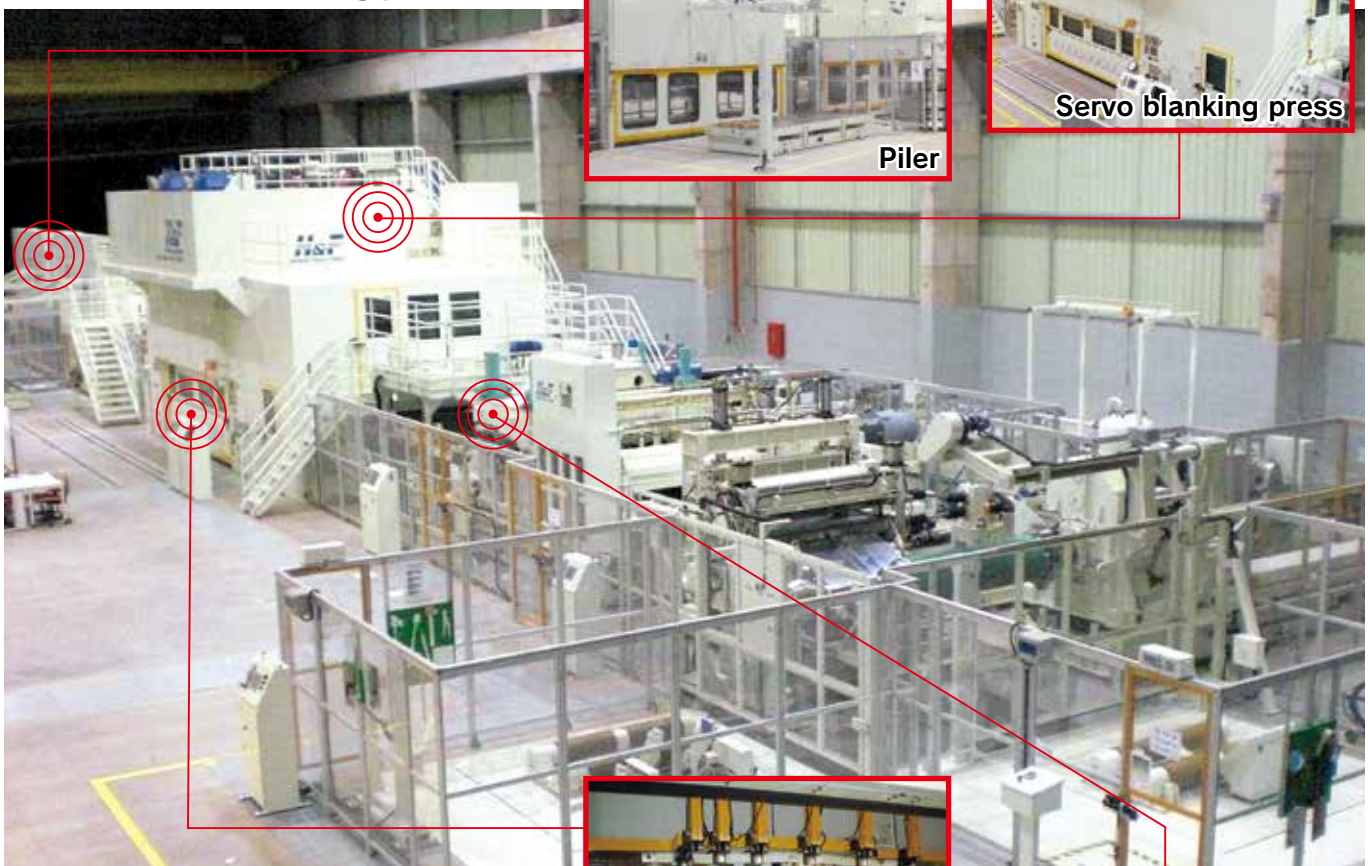
For ultra high-strength steel

Blanking press line for 1.5GPa class ultra high-strength steel with servo press and highly rigid leveler with 21 pieces work roll is available.

Integrated manufacturing system

All machines in the line such as press, coil feeder, piler and trapezoid shear are designed and manufactured by H&F.

BFCS5000 Servo blanking press line



Servo blanking press line for outer panel typical specification

Press type	BFCS5000
Press capacity [kN]	5000(Servo)
Press speed [min ⁻¹]	~ 80
Bolster size [mm]	4000 x 2500
Coil feeder	Tandem type
Coil width [mm]	~ 1830
Coil thickness [mm]	~ 2.8
Piler	2 stage 4 row belt Electromagnetic
Piling size [mm]	~ 1830 x ~ 4000 x 2
Trapezoid shear	Suspend type

Optimizing slide speed when cutting by servo press feature, enables improving the accuracy of cut surface and noise reduction.

BEF5000 Blanking press line



Blanking press line typical specification

Press type	BEF5000
Press capacity [kN]	5000
Press speed [min ⁻¹]	~ 80
Bolster size [mm]	4500 x 2500
Coil feeder	Tandem type
Coil width [mm]	~ 1850
Coil thickness [mm]	~ 2.3
Piler	2 stage 4 row belt Electromagnetic
Piling size [mm]	~ 1850 x ~ 4000 x 2
Trapezoid shear	—

BEF8000 Blanking press line



Blanking press line typical specification

Press type	BEF8000
Press capacity [kN]	8000
Press speed [min ⁻¹]	~ 80
Bolster size [mm]	4500 x 2500
Coil feeder	Tandem type
Coil width [mm]	~ 1850
Coil thickness [mm]	~ 3.2
Piler	2 stage 4 row belt Electromagnetic
Piling size [mm]	~ 1850 x ~ 4000 x 2
Trapezoid shear	Suspend type

BFL10000 Link blanking press line



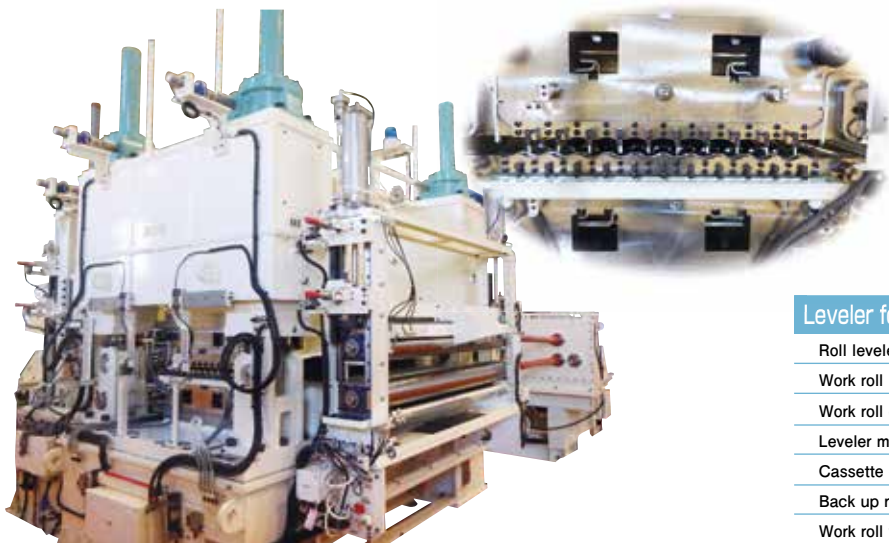
Link blanking press line typical specification

Press type	BFL10000
Press capacity [kN]	10000(Link)
Press speed [min ⁻¹]	~ 50
Bolster size [mm]	3700 x 2200
Coil feeder	Tandem type
Coil width [mm]	~ 1830
Coil thickness [mm]	~ 3.2
Piler	—
Piling size [mm]	—
Trapezoid shear	—

※For high-strength steel

Blanking press line peripheral equipment

Leveler for ultra high-strength steel



Leveler for ultra high-strength steel typical specification

Roll leveler [Hi]	6
Work roll [pcs]	10/11
Work roll diameter [mm]	55
Leveler motor [kw]	150 x 2
Cassette change	Manual
Back up roll [rows]	7
Work roll washer	—

Cassette type leveler



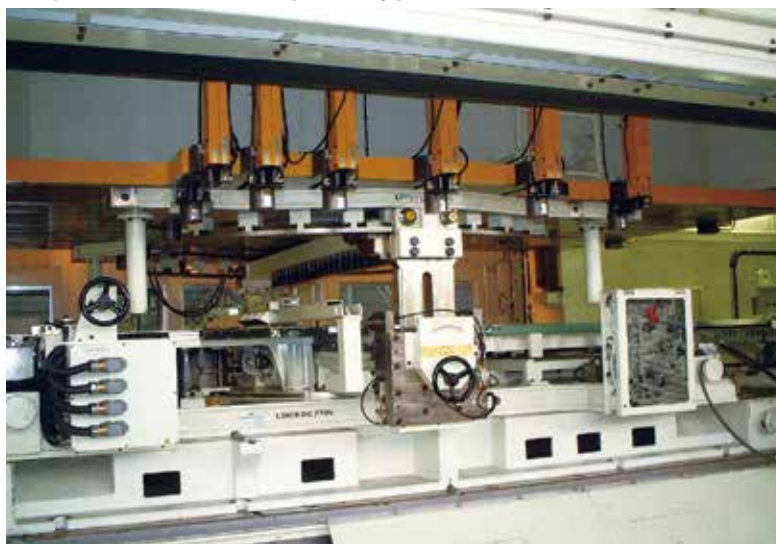
Cassette type leveler enables

- Work roll replacement time reduction
- Work roll adjustment time reduction
- Adjustment accuracy stability

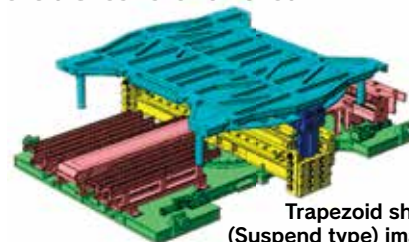
Cassette type leveler typical specification

Roll leveler [Hi]	6
Work roll [pcs]	5/6
Cassette change	Manual
Back up roll [rows]	5
Work roll washer	Yes

Trapezoid shear(Suspend type)



This trapezoid shear is designed for low noise and low impact, because no upper die hitting. High speed production can be expected, because the springs which are used for old type trapezoid shear are removed.



Trapezoid shear
(Suspend type) image

Trapezoid shear(Suspend type)typical specification

Trapezoid shear type	Suspend type / Single blade / Down cut
Number of strokes [min ⁻¹]	~ 80(due to angle)
Coil thickness [mm]	~ 2.8
Coil width [mm]	~ 1830
Trapezoid angle [deg]	~ ±35

Laser blanking line(PAT.)

Laser blanking line is a line that press machine is replaced with laser cut device in traditional blanking press line consisting of coil feeder, press and piler.

Coil is continuously fed, cut any shape by laser cut device and only blanks are stacked by piler after scrap and reuse material separated.

No dies required

No dies, no die storage, no die manufacturing period and no die change time required.

Building cost reduced

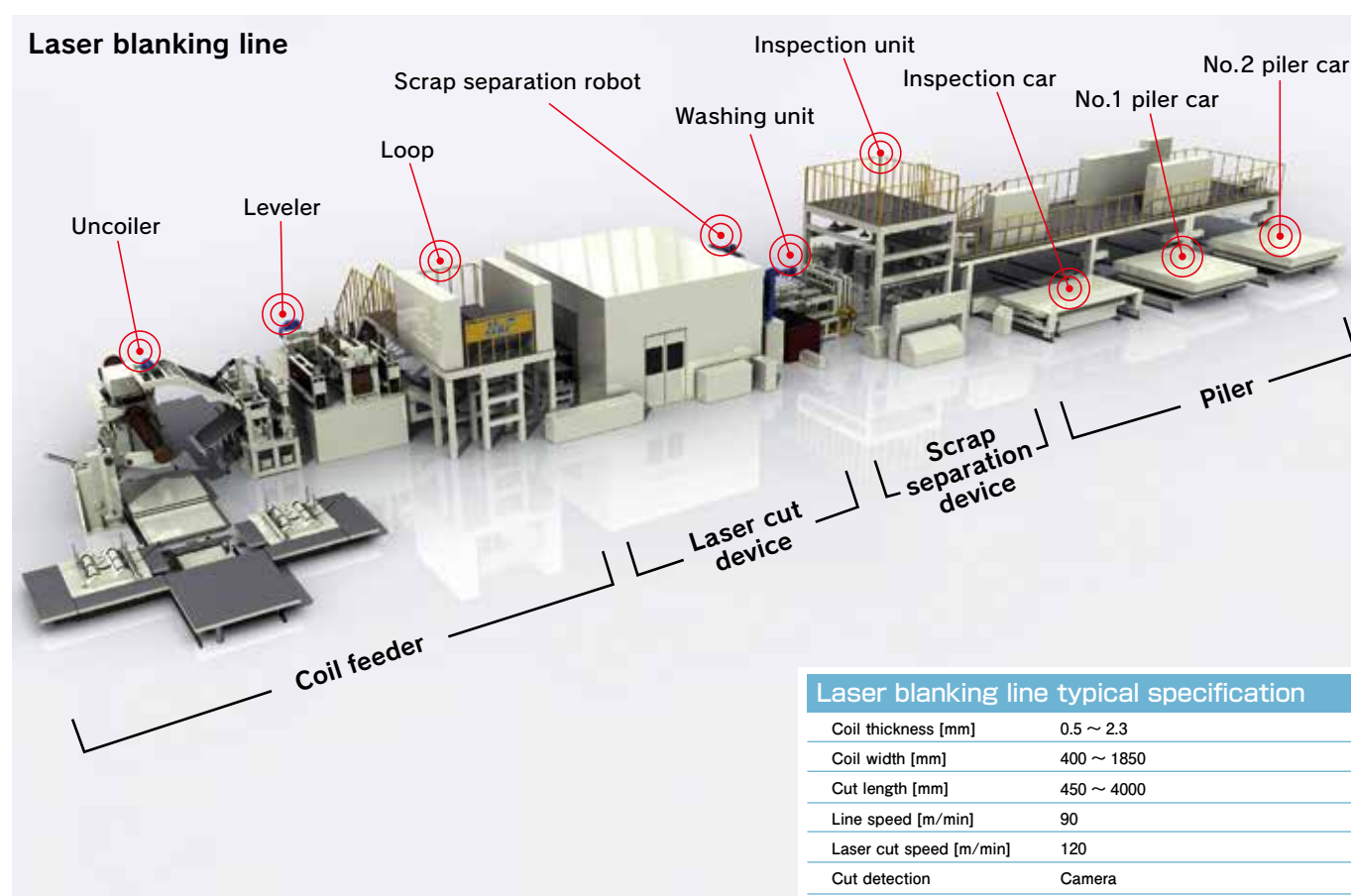
No press pit and loop pit required.
Line installable in low height building.

Cut surface quality improvement

Cut surface quality improved by laser cutting and reduce trouble.

Easy blank shape change

Blank shape changeable easily and quickly by changing shape data.
Also blank shape flexibility is increased.



Laser blanking line typical specification

Coil thickness [mm]	0.5 ~ 2.3
Coil width [mm]	400 ~ 1850
Cut length [mm]	450 ~ 4000
Line speed [m/min]	90
Laser cut speed [m/min]	120
Cut detection	Camera
Scrap separation	Robot pick up/natural fall
Piler car	2(Alternate piling possible)
Piling	Zero speed(Fall after blank stop)

Trial press

Wide variation

From 5000kN to 24000kN, servo press, crankless press and link press are manufactured to adapt customer's needs.

World wide delivery

A lot of trial presses are delivered to car manufacturers and die manufacturers in the world.

MFES24000 Servo trial press



Servo trial press typical specification

Press type	MFES24000
Press capacity [kN]	24000(Servo)
Press speed [min ⁻¹]	~ 20
Bolster size [mm]	5000 x 2500
Die cushion capacity [kN]	4000(Servo)

MFE15000 Trial press



Trial press typical specification

Press type	MFE15000
Press capacity [kN]	15000
Press speed [min ⁻¹]	~ 20
Bolster size [mm]	3500 x 2500
Die cushion capacity [kN]	1300 (Air)

Position monitoring control system for robot line

Improving productivity

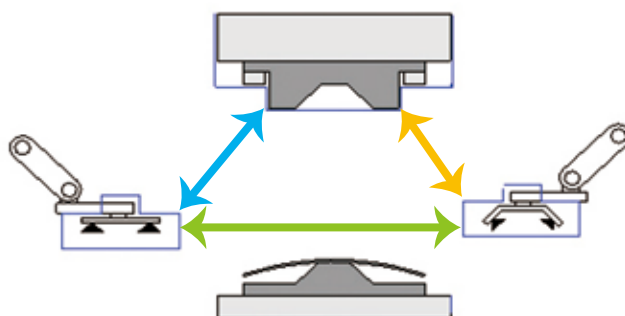
Maximum 14% productivity improvement is expected from existing system. In existing system it is very difficult to optimize the start timing of the robot system, because the operator needs to check the interference distance visually.

This position monitoring control system can display the interference distance, and it is easy and quick to optimize the start timing of the robot system.

Start timing input



Monitoring interference distance



Press line visualization by IoT

Connecting line management system to internet, production situation, fault condition and inspection information of press line in each factories are monitored far away.

(1) Fault monitor

When the fault is detected the message is displayed and shows the faulty block in the line layout.

(2) Fault history monitor

Fault history is displayed.

(3) Fault device auto search

Fault device on fault monitor and fault history monitor can be searched from PLC program.

(4) Fault help

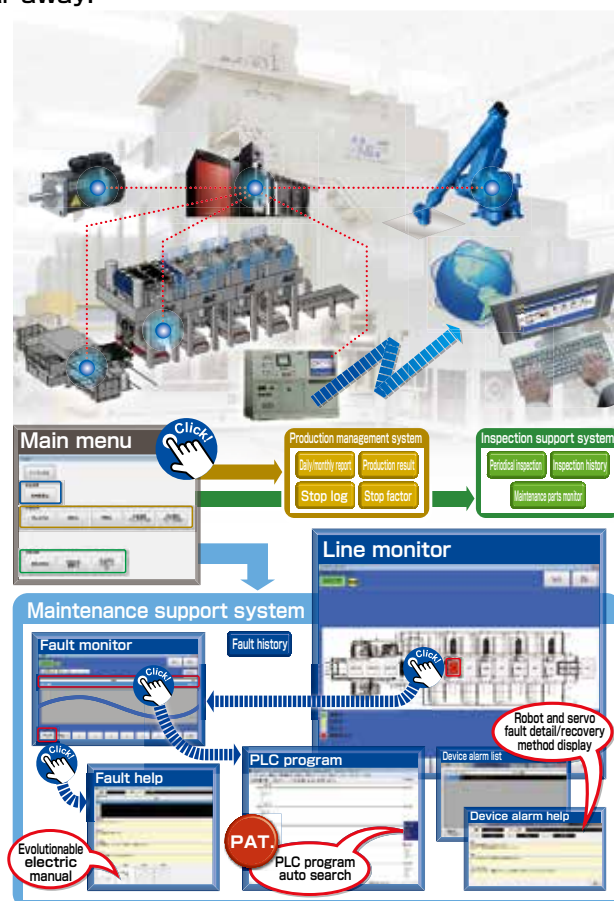
Recovery procedure, photos, and drawings can be registered for fault items, and this helps to shorten recovery time when fault occurs.

(5) Device alarm help

Faults from robots, servo system and inverter system are displayed.

(6) Maintenance and inspection

Monthly and annual maintenance and inspection items are displayed as scheduled. This prevents non inspected items.



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