

HA HAN YOUNG
MACHINERY CO.,LTD
THE COMPANY INTRODUCTION



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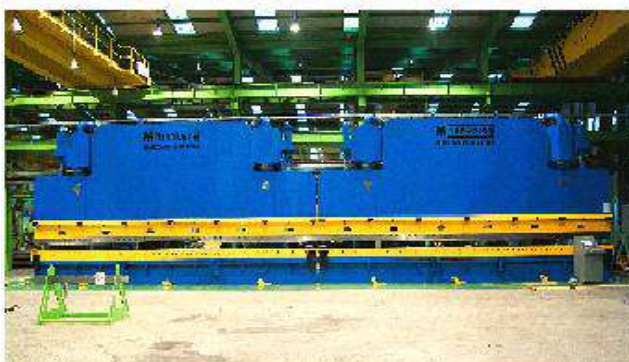
HEAD OFFICE : 54-48, Gomo-ro 134beon-gil, Jillye-myeon,
Gimhae-si, Gyeongsangnam-do, South Korea

PLANT 1 : 1, Seobu-ro 411beon-gil, Jillye-myeon,
Gimhae-si, Gyeongsangnam-do, South Korea

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1. About Us

1.1 Current Status and History

1) General Status

Performing Entity	Name of company		Han Young Machinery Co., Ltd.		Homepage	www.hanyounghex.com
	Date of Establishment		March 1989			
	Business Registration Number		615-81-29754		Corporation registration number	195511-0060362
	Address	Head office	54-48, Gomo-ro 134beon-gil, Jillye-myeon, Gimhae-si, Gyeongsangnam-do, South Korea			
		Plant 1	1, Seobu-ro 411beon-gil, Jillye-myeon, Gimhae-si, Gyeongsangnam-do, South Korea			
	Research Organization Name		Development Department			
	Industry (Main Products)		Manufacture of Metal Forming Machinery and Production of Stainless Steel Hexagonal and Square Bars			
CEO	Name		Lee Young-sik		T E L	+82-55-346-4800~2
	Mobile phone		+82-10-3846-6553			
	E-mail		hanyoungmch@hanmail.net		F A X	+82-55-346-4803

○ Company location



Head office : 54-48, Gomo-ro 134beon-gil, Jillye-myeon, Gimhae-si, Gyeongsangnam-do, South Korea
 Plant 1 : 1, Seobu-ro 411beon-gil, Jillye-myeon, Gimhae-si, Gyeongsangnam-do, South Korea

2) Company history

- 1989** 03 Established as Hanyoung Hydraulic Machinery
- 1991** 10 Renamed to Hanyoung Machinery (Expansion and relocation)
- 1993** 08 Developed and delivered Korea's first Tandem Press Brake (2,000Ton × 12,000L) to Hyundai Heavy Industries
- 10 Developed and supplied Korea's first domestically produced Cold Rolling Mill Work Roll Automatic Grinder to POSCO Gwangyang Steelworks
- 1995** 06 Exported container manufacturing equipment to Guangdong Province, China
- 1996** 03 Developed Korea's largest Press Brake and supplied to Hyundai Heavy Industries, Kyungyong Heavy Industries, etc



- 05 Exported transmission tower manufacturing equipment to Vietnam (Hyundai-Dongan)
- 1998** 03 Developed and delivered Korea's first Single Press Brake (4,000Ton × 18,000L) to Kyungyong Heavy Industries, Dongwoo Industrial Machinery, Daesung Industrial Machinery
- 10 Exported rubber conveyor belt equipment to Dammam Factory, Saudi Arabia
- 2002** 03 Developed ERW Tapered Pole Automatic Welding Line



- 11 Established Hanyoung Machinery Co., Ltd. (Commercialization of JCO process pole production line)
- 12 Exported pole production line to Al-Babtain Industries, Saudi Arabia
- 2004** 01 Developed and commercialized stainless steel forming equipment [Jan 2004 – Dec 2009]
- 02 Initiated development and commercialization of JCO process pole production line (utility poles, street lighting poles)
- 05 Completed Jinrye factory construction and relocation; Merged with Hanyoung Machinery; Started development of stainless steel hexagonal bars
- 08 Supplied cold rolling shearing line to POSCO Pohang Steelworks
- 2005** 08 Established special pipe drawing business division and commercialized related equipment
- 2007** 02 Developed and supplied production line for construction heavy equipment to Kunhwa Co., Ltd.



- 2008 04** Manufactured and delivered Single Press Brake (3,500Ton × 20,000L) to Samjin HIC Co., Ltd.
- 2009 12** Established Hanyoung Industry – Specialized production plant for stainless steel hexagonal and polygonal bars



- 2010 02** Manufactured and delivered Tandem Press Brake (3,000Ton × 20,000L) to Woojin ENG Co., Ltd. (Gunsan)
- 2012 01** Developed and supplied thick-wall pipe production line to Guman Heavy Industries Co., Ltd.
- 2013 04** Manufactured and delivered Single Press Brake (2,000Ton × 14,000L) to Woojin ENG Co., Ltd. (Gunsan)



- 2015 02** Developed variable forming equipment for round bars
- 07** Developed and supplied swaging production line for shipbuilding to Hyundai Heavy Industries
- 2016 06** Developed and manufactured peeling machine for stainless round bar processing



- 2017 03** Successfully completed and commercialized a technology development project supported by the Ministry of Trade, Industry and Energy (MOTIE)
- 04** Manufactured and supplied JCO process hydraulic system to SK Oceanplant (Miryang Plant)
- 2019 01** Completed development and commercialization of machinery and molds for offshore wind power generation equipment
- 2020 12** Manufactured and supplied monopile roll bending machine for offshore wind power facilities to SK Oceanplant (Goseong Plant)
- 2021 09** Successfully completed Technology Innovation Development Project (Materials, Parts & Equipment Strategy Program) supported by Korea Technology and Information Promotion Agency for SMEs (TIPA)[Sep. 2021 – Aug. 2023]
- 12** Selected as the main contractor for government-supported renewable energy project by Gunsan Shipbuilding & Marine Technology Cooperative
- Manufactured JCO process thick-wall pipe production line
- Provided technical guidance to subcontractors
- 2024 03** Delivered HYD' Single CNC Press Brake (3,000Ton × 18,000L) (applying patented crowning system technology in Korea) to Yuseok Steel, Cheongju Branch[Mar. 2024 – Oct. 2024]

1.2 Patent and Certification Status

1) Patent status

Patent Name	Applicant	Registration Date	Patent NO.
Round Bar Forming Device	Han Young Machinery Co., Ltd.	April 16, 2013	NO. 10-1257006
Variable Forming Device (Japan)	Han Young Machinery Co., Ltd.	September 20, 2019	6588165
Variable Forming Device (China)	Han Young Machinery Co., Ltd.	Jan. 17, 2020	ZL20168004735 4.9
Variable Forming Device (USA)	Han Young Machinery Co., Ltd.	June 30, 2020	10,695,807
Variable Forming Device (Europe – Germany, Italy)	Han Young Machinery Co., Ltd.	May 4, 2022	EP3335811
Variable Forming Device (India)	Han Young Machinery Co., Ltd.	Aug. 4, 2023	201817003336
Steel Plate Bending Device (Crowning System)	Han Young Machinery Co., Ltd.	Nov. 27, 2025	No. 10-2893955

2) Certification status

Certification Name	Certificate Authority	Registration date	Certificate number
QUALITY MANAGEMENT SYSTEM CERTIFICATE ISO 9001:2015	KTR-CC	July 19. 2019	IQS 9346
Qualification Test Record (NORSOK M-650)	DNV	October 24, 2024	HQTR-202401



[Domestic]



[Japan]



[China]



[United States]



[Europe]



[India]



[ISO 9001:2015]



[NORSOK]

1.3 Research Achievements

1) Research Performance

A Study on Comparative Analysis of Rolling Characteristics of Special Alloy Hexagonal Bars for Advancement of Drawing Forming Systems

(Published in Journal of the Korean Society of Manufacturing Process Engineers, May 2021)

A Study on Stability Analysis of Bearings and Shafts According to Rolling of Monel Alloy Square Bars

(Published in Journal of the Korean Society of Manufacturing Process Engineers, October 2022)

A Study on Plastic Deformation in Drawing and Roller Characteristics of Monel Alloy Square Bars

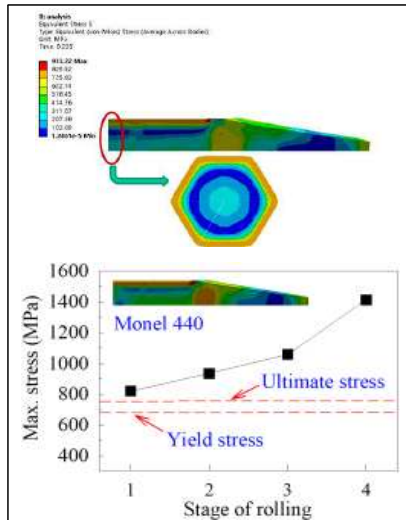
(Published in Journal of the Korean Society of Manufacturing Process Engineers, December 2022)

A Study on Four-Stage Rolling and Reaction Force Characteristics of Monel Alloy Hexagonal Bars

(Published in Journal of the Korean Society of Manufacturing Process Engineers, June 2023)

A Study on Structural Analysis of Turning Wheel Using Rolling Reaction Force of Monel Alloy Square Bars

(Published in Journal of the Korean Society of Manufacturing Process Engineers, August 2023)



[Product-Related Research Papers]

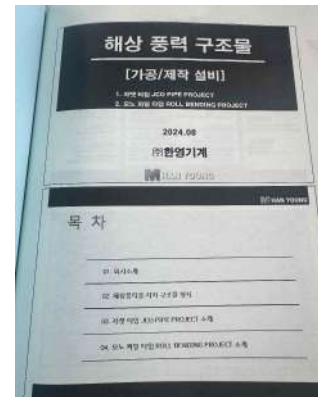
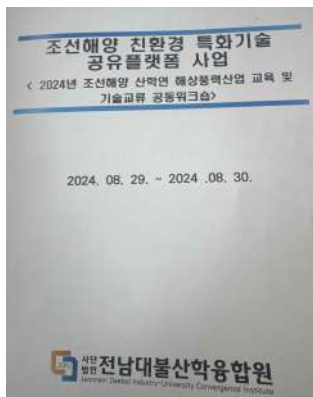
1.4 Education and Technical Exchange

1) Participation in Offshore Wind Power Education & Technical Exchange

(Lecture on Production Facility Establishment Plan)

- Organized by: Jeonnam Daebul Industry-Academia Convergence Institute

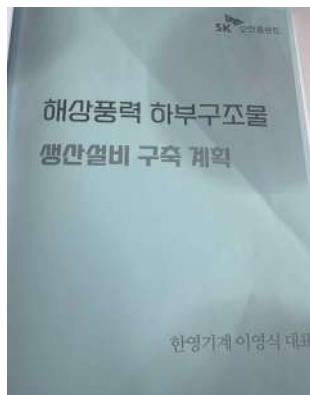
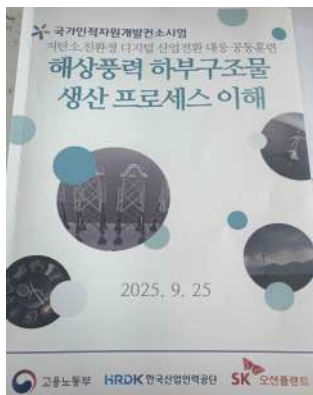
Period	August 29, 2024 – August 30, 2024
Description	Joint workshop on offshore wind power industry education and technical exchange among industry, academia, and research institutes in the shipbuilding and offshore sector
Invited Speaker	Young-Sik Lee, CEO of Hanyoung Machinery Co., Ltd.



- Participation in Offshore Wind Power Education & Technical Exchange

(Lecture on Understanding Offshore Wind Substructure Production Process)

Period	September 25, 2025
Description	Understanding the production process of offshore wind substructures
Invited Speaker	Young-Sik Lee, CEO of Hanyoung Machinery Co., Ltd.



1.5 Organization status

○ Organizational chart



1.4 Partner status

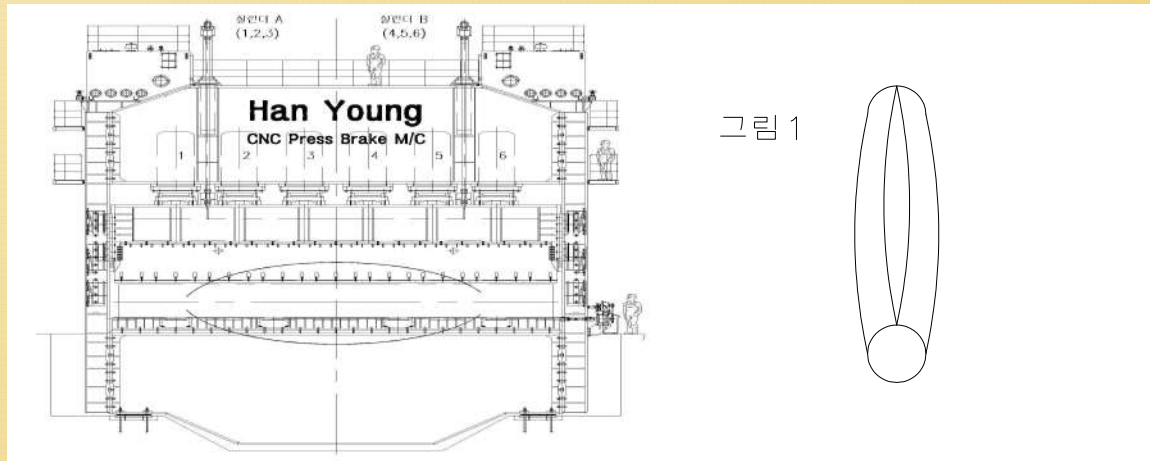
SeAH Changwon Integrated Special Steel		HWASUNG FASTENERS	
TPLEX		DK-LOK	
Hy-Lok Korea		SK오션플랜트(주)	

2. Relevant Owned Technology

1	JCO Process – Offshore Wind Structure Production Line Manufacturing Technology	
2	Cold Drawing (New Process Cold Drawing – [World Patent] High-Hardness Forming Technology for Special Alloy Stainless Steel Materials)	
3	Construction, Automotive & Heavy Equipment	
4	Shipbuilding	

2.1 JCO Process for Offshore Wind

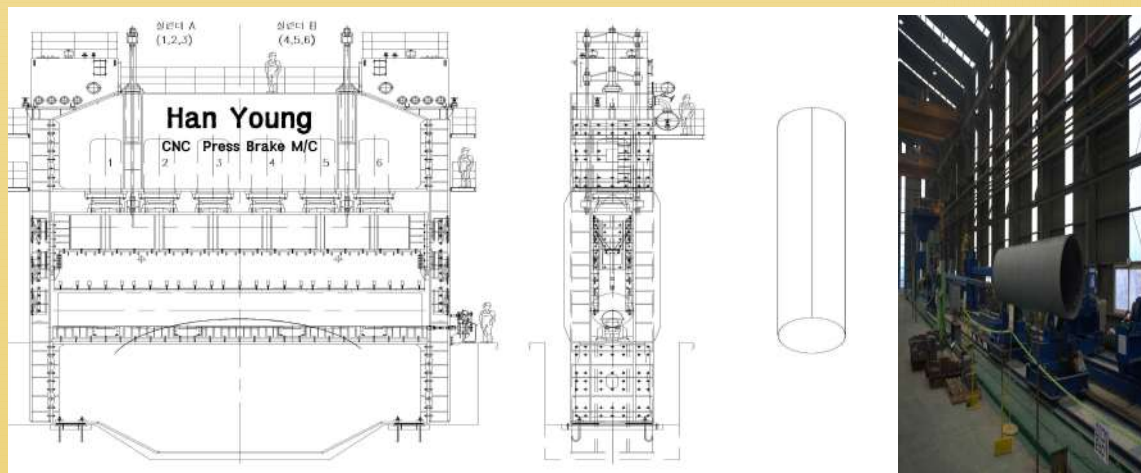
※ Core Technology for Pipe Production Equipment in the JCO Process



Sagging During Bending

(Reference Diagram – Figure a)

When flat steel plates are repeatedly bent to form a pipe shape, the end sections of the pipe can achieve the desired shape by adjusting the press settings. However, the central portion of the pipe may develop gaps due to residual stress and elasticity of the steel material.



Sagging Compensation Device

Figure (b) Crowning Effect

The crowning device (Korean Patent) is an automated mechanism that corrects the gaps shown in Figure (a) into the desired shape shown in Figure (b).

This technology maximizes productivity and enables the production of high-quality pipes. It represents a key automated equipment technology for JCO process pipe production.

※ Necessity and Applicability of the Sagging Compensation Device (Crowning System)

Structural Solutions for Wave Formation and Straightness Defects in Steel Plate Bending Processes

1. Deflection Phenomenon in Steel Plate Bending

During steel plate bending, the material exhibits different inherent stresses and elastic recovery forces depending on thickness, width, and bending length. These factors, combined with several other elements, can cause bending shape defects, including:

Structural stiffness and precision limits of the bending equipment

Wear and uneven load distribution of the bending dies

Deflection of the upper and lower frames

Load concentration in the central portion due to increased plate thickness and width

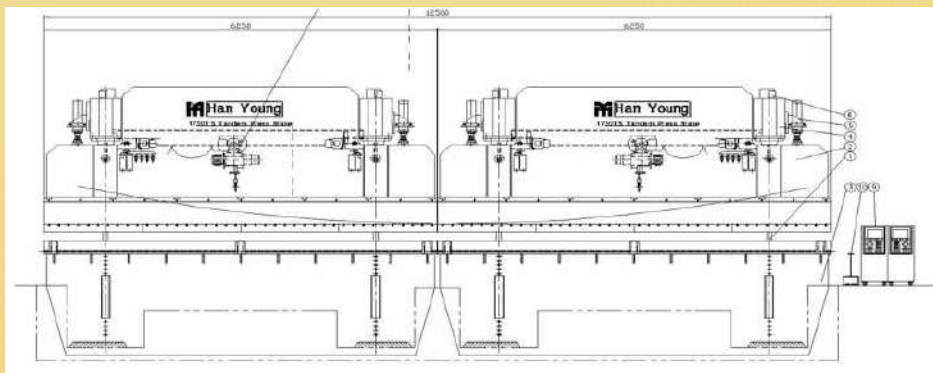
As a result, the bending process may experience:

Wave formation along the bending line

Variations in bending angles at different positions

Reduced straightness, higher defect rates, and decreased repeatability

These issues directly lead to assembly defects, exceeded dimensional tolerances, and increased rework.



2. Solution: Crowning Device

To address these issues, the bending system must include a crowning device that can:

Compensate selectively for sagging in critical areas

Maintain high positioning accuracy of the upper punch slide

Ensure repeatability of bending precision and control wave formation

Limitations of Conventional Crowning Systems:

Traditional crowning systems are designed with centralized left-right alignment

For short bending lengths, these systems work adequately

For long steel plates or multiple bending points, operator skill and experience are required to maintain straightness

Consequently, it is difficult to consistently achieve repeatable precision in bending straightness and wave control for longer steel plates

1. Recommendation for a New Crowning System

To fundamentally address the problems of wave formation and straightness defects in steel plate bending, we recommend a newly developed, specially designed crowning system (Korean Patent) that completely departs from conventional crowning methods.

2. Applicability of Hanyoung Machinery's Patented Crowning System

Unlike traditional crowning systems, Hanyoung Machinery's crowning system:
Selectively compensates only the areas where actual deflection occurs during plate bending

Utilizes a structural crowning design focused on the effective load zones, not the entire bending die

Accounts for elastic stress differences due to variations in plate thickness and width

Benefits include:

Improved wave control and bending precision

Uniformity of bending angles along the entire length

Enhanced straightness and repeatability

Stable shape quality even for long plates and thick steel plates

This is not a simple correction device; it is a core structural technology that fundamentally controls bending quality.

3. Conclusion

Wave formation and straightness defects in steel plate bending cannot be solved solely by operator skill or increased pressing force.

Incorrect crowning → Ineffective compensation

Excessive pressing force → Increased angle deviation and shape distortion

Proper crowning → Fundamental improvement of bending quality

Hanyoung Machinery's patented crowning system precisely controls crowning in required zones using a servo motor-driven system, based on actual load conditions such as bending length, plate thickness, and bending position.

Production parameters and conditions are stored in an industrial computer memory for retrieval and application as needed.

Advantages of this system:

Ensures quality stability independent of operator skill

Maintains repeatability for long and thick steel plates

Maximizes process reproducibility in multi-product production environments

This system is a core technology that structurally determines steel plate bending quality, not merely an auxiliary device.

Features and Advantages of the JCO Process

Key Features

Large-Diameter Pipe Production

Suitable for manufacturing thick-walled steel pipes (e.g., 16–56 inches)

High Precision and Uniform Quality

Gradual forming process ensures consistent cross-sectional quality

Excellent Weld Strength and Reliability

SAW (Submerged Arc Welding) provides strong, defect-free welds

Versatile Applications

Widely used in building structures, oil & gas pipelines, gas lines, and structural steel pipes



Process	Features	Advantages
JCO Process	Gradual bending (J → C → O) followed by welding	Produces steel pipes of various sizes with lower equipment cost

Summary

The JCO Process gradually forms steel plates to produce large-diameter steel pipes.

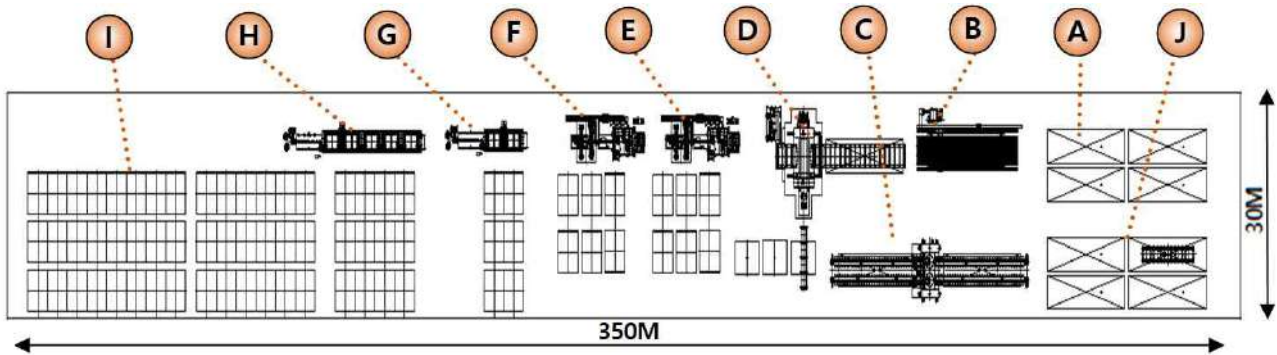
Advantages:

Uniform quality

Relatively low production costs

Applicable across various industries such as construction structures, oil pipelines, and gas pipelines

1) Offshore Wind JCO Process Monopile Production Line LAY-OUT



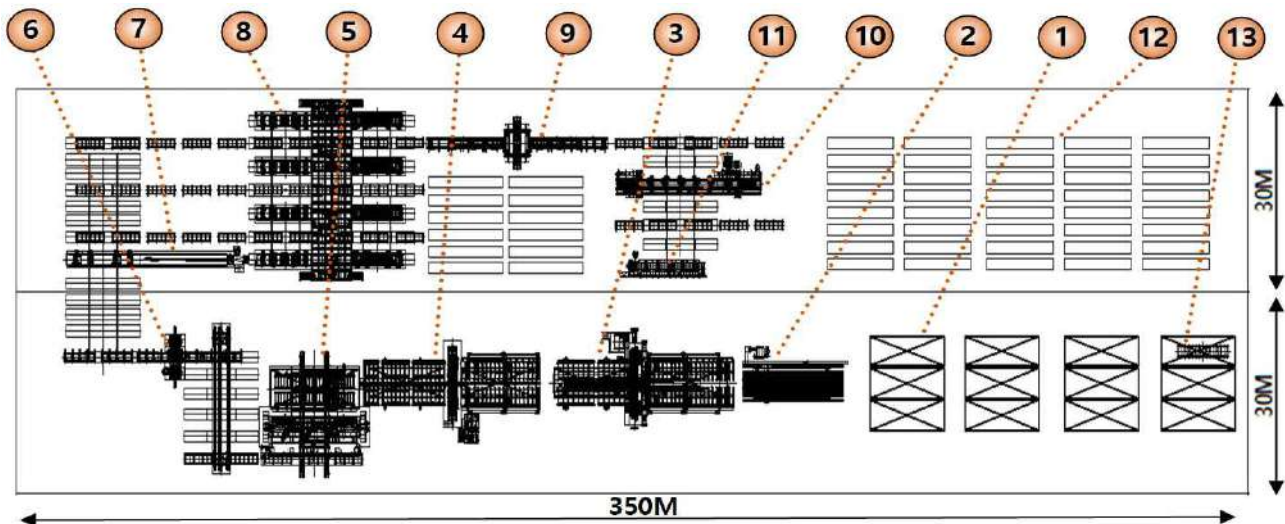
1-1) Equipment Layout (A ~ J)

No.	Equipment Name	Photo	No.	Equipment Name	Photo
A	Steel Plate Yard		F	Pipe Outer Surface Straight Welding Machine	
B	CNC Automatic Steel Plate Gas Cutter		G	Pipe Inner/Outer Connection Welding Machine (8m)	
C	Steel Plate Edge Bending Press		H	Pipe Inner/Outer Connection Welding Machine (16/24m)	
D	Hydraulic Roll Bending Equipment		I	Pipe Storage Yard	
E	Pipe Inner Surface Straight Welding Machine		J	Steel Plate Handling & Transfer Magnetic Lift	

1-2) Monofilament Product Images



2) Offshore Wind JCO Process Jacket Production Line Layout



2-1) LAY-OUT Equipment Name (A ~ 13)

No.	Equipment Name	Photo	No.	Equipment Name	Photo	No.	Equipment Name	Photo
1	Steel Plate Yard		5	Pipe Bending Press		9	Pipe Straightening Equipment	
2	CNC Automatic Steel Plate Gas Cutter		6	Pipe Trial Assembly Equipment		10	UT Inspection Equipment	
3	Edge Milling Equipment		7	Pipe Inner Surface Welding Machine		11	Pipe Costa Equipment	
4	Edge Bending Equipment		8	Pipe Outer Surface Welding Machine		12	Pipe Storage Yard	
						13	Steel Plate Transfer Magnet	

2-2) Jacket Production Images



3) Industrial Machinery

○ Thick-Walled Pipe Production Line Design and Manufacturing

- JCO Process Heavy-Wall Pipe Production Machine, Roll Bending Machine, and Press
: Pipe production press technology, including presses such as 6,000TON x 12M, 6,000TON x 6M, 10,000TON x 14M, 2,500TON, and 1,500TON



Supplied to SK Inc.
(Monopile Production Machinery for Wind
Turbine Substructures)



Delivery to Gunsan Shipbuilding & Marine
Technology Business Cooperative
(JCO method pipe production PRESS 6,000TON x 6M)



Supplied to Gunsan Shipbuilding & Marine
Technology Industry Cooperation
(JCO Method Pipe Production PRESS 6,000TON x 12M)



Delivery of 2,500-ton Press to Gunsan
Shipbuilding & Marine Technology
Business Cooperative
(Pipe Manufacturing Production Equipment)



Delivery to Guman Heavy Industries
(Pipe Fabrication Track Welding Machine)



Delivery to Guman Heavy Industries
(Pipe Manufacturing Internal and External
Welding Machine)

○ Thick-Walled Pipe and Jacket Products of JOC Method

- Thick-Walled Pipe

: It is a type of steel pipe with a thicker wall compared to standard steel pipes, used in industries that require high pressure and strength. It is primarily used in offshore structures, plant piping, large steel pipe piles (foundation structures), and power plant piping.

- Jacket

: It is an external protective structure used for offshore structures and wind turbine foundation structures. It is typically formed by welding steel pipes to create a frame, designed to maintain high strength in marine environments.



The production of thick-walled pipes has
been completed
(Storage yard for thick-walled pipe products)



Jacket fabrication completed
(Storage yard for jacket products)

Others – JCO Process Pipe Production Machines and Manufacturing Technology

Key Advantages

1. High-Efficiency Mass Production

TEPA Pipe Utility Pole Production Machines are optimized for large-scale production. Automation of peripheral equipment reduces production time and cost, enabling fast, high-volume manufacturing.

Essential for large infrastructure projects.

Precise Control and Quality Maintenance

Steel products like utility poles require consistent dimensions and strength.

The machines can precisely control pressure and speed, minimizing dimensional deviations and maintaining uniform quality.

Automation ensures consistent product quality and reduces errors and defects during production.

Flexible Production of Various Sizes and Shapes

Machines can produce utility poles in custom diameters, lengths, and thicknesses according to client requirements.

Flexibility is critical for large steel products like utility poles.

Minimal Material Waste

Optimized material usage reduces waste and prevents loss of steel resources.

Helps lower material costs and has a positive environmental impact.

High-Strength Utility Pole Production

Capable of producing high-strength steel utility poles with excellent durability.

Ensures long-term stability and usability under various climates and conditions.



Delivered to Hyundai Heavy Industries
(Machinery for shipbuilding equipment production)



Delivered to Al-Babtain, Saudi Arabia
(Machinery for utility pole production using
JCO method TEP pipes)

[Delivery Photos]



JCO Method Pipe Production Press Brake



JCO Method Tech Welding Machine



JCO Method Edge Bending Machine



JCO Method Crowning Device



JCO Method Pipe Production Die



JCO Method Pipe Feeding System Fabrication Process



On-site Assembly of Press Brake



On-site Installation of Pre-bending Machine

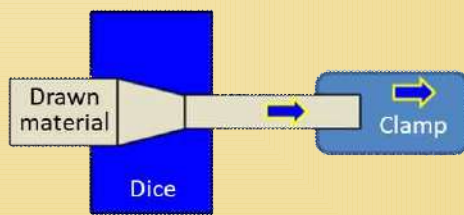
2.2 Cold Drawing

(Development of Forming Technology for High-Hardness Materials)

1) Forging Technology

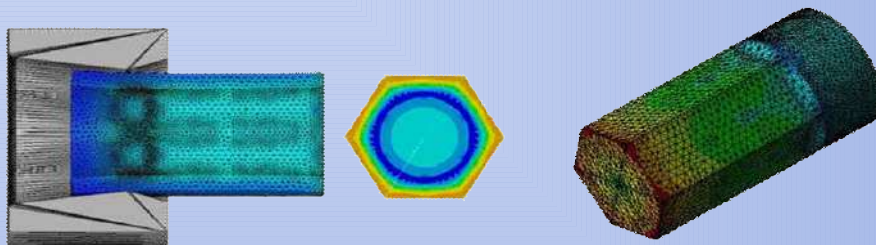
※ Overview of Cold Drawing Machining Technology

Cold drawing is a key machining method where metal is drawn through a die at room temperature, reducing its cross-sectional area and improving dimensional accuracy.



※ Key Advantages of Han Young Machinery Co., Ltd.'s Technology

1. Excellent Surface Quality – Smooth surface finish minimizes the need for additional treatment.
2. High Dimensional Accuracy – Strict tolerance control makes it ideal for precision parts.
3. Enhanced Mechanical Properties – Cold working strengthens the material, improving durability.
4. Minimized Material Loss – More efficient than cutting processes, reducing production costs.
5. High Productivity – Continuous, fast processing ensures superior throughput.

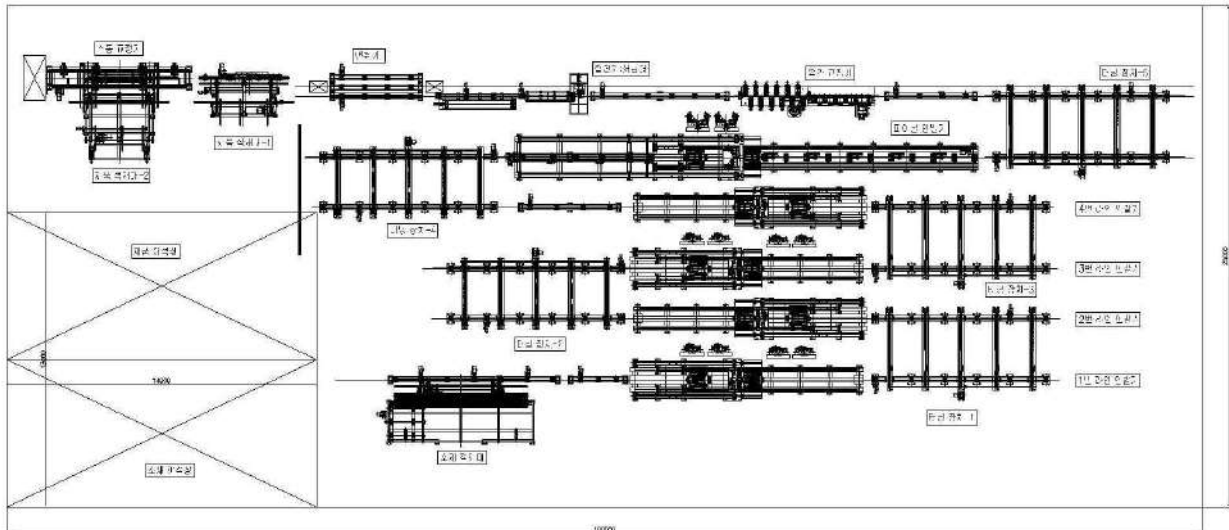


Our cold drawing technology delivers high reliability and quality across various industries, including semiconductors, medical devices, nuclear power, automotive components, electrical/electronic parts, and precision machinery.

1-1) Cold Drawing Equipment Technology (Global New Techniques)

○ Cold Drawing Automation Technology for Stainless Steel & Special Alloys (Capable of Producing High Hardness Products)

Hexagonal Automatic Insertion Line Layout

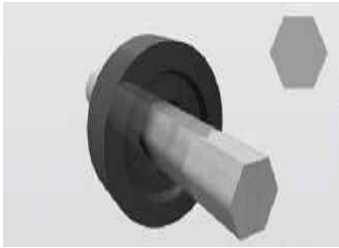
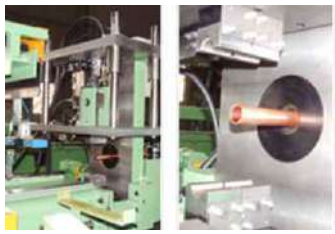
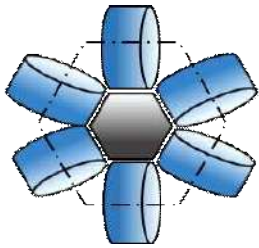


- Equipment Installation Scope : 100,000 × 25,000 mm
- Available Product Shapes : Hexagonal Bar, Square Bar
- World's First Successful R&D of a New metal Forming Line for Stainless Steel & Special Alloys
- Patent registered for a new method in metal forming technology
 - Countries with registered patentsregistered : Widely held across South Korea, the U.S., Europe, Japan, China, Taiwan, and India

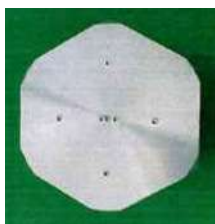


[Cold Automated Drawing Equipment]

○ Characteristics of mold structure (based on hexagonal bar)

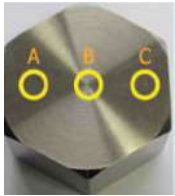
Category	EJP (Germany)	FUSSIOKA(Japan)	Han Young Machinery Co., Ltd.
Structural features			
Intellectual Property	No patented technology	No patented technology	Secured domestic & international patents (USA, Japan, Germany) for 4-inch models
Molding method	Fixed-type Drawing Die (Low Productivity)	Fixed-type Drawing Die (Low Productivity)	Variable Roll-Die for Shaping Special Alloys (High Productivity)
Production Capacity	5 tons (Hexagonal size 38.1 mm)	5 tons (Hexagonal size 38.1 mm)	17 tons (Hexagonal size 38.1 mm)
Material Hardness Improvement	SUS available; special alloys not supported; surface hardness can be enhanced; deep (1/4D) hardness not possible	SUS available; special alloys not supported; surface hardness can be enhanced; deep (1/4D) hardness not possible	SUS and special alloys available; surface hardness can be enhanced; core (1/4D) hardness can also be improved
Core Hardness	HRB 80 ~ 95	HRB 80 ~ 95	HRB 98 ~ 105

○ Key Advantages



- World's first roll-driven rolling method developed and applied.
- Uniform hardness maintained across entire product range: semiconductors, medical devices, LNG, chemical plants, ships, and high-pressure fittings.
- Applied for high-hardness components in nuclear power plants.

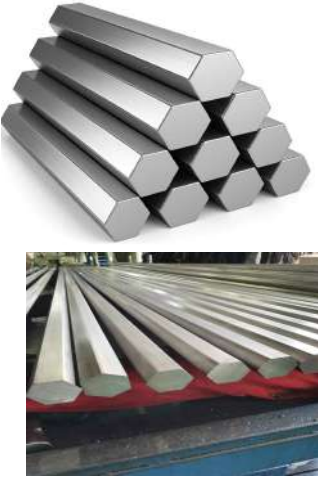
< Hardness Performance >

KIND	HARDNESS(HRB)			PICTURE	NOTE
	POINT"A"	POINT"B"	POINT"C"		
HIGH HARDNESS	110	105	110		HEX 38.1
BRIGHT ANNEALED	103	100	103		

1-2) Molding Technology

○ Hexagonal bar product (Min 20 ~ Max 100)

- Input Round Bar : $\varnothing 30 \sim \varnothing 120$ mm
- Surface Hardness : HRB 98 ~ 105

Product Shape	Specifications	Length	Material
	MIN 20 ~ MAX 100	Basic 6M (Adjustable to your desired length)	316L 303 MONEL HASTETLOY INCONEL 304L 410 ALLOY

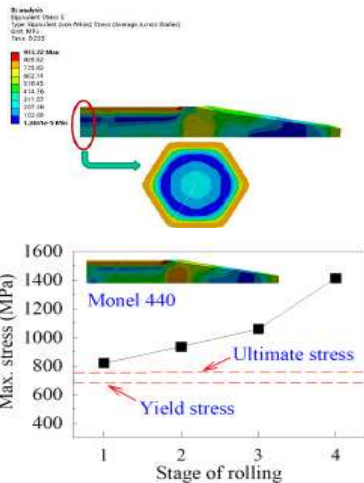
○ Square Bar Product (Min 12 - Max 100)

- Input Round Bar : $\varnothing 24 \sim \varnothing 112$ mm
- Surface Hardness : HRB 99 ~ 104.5

Product Shape	Specifications	Length	Material
	MIN 12 ~ MAX 100	Basic 6M (Adjustable to your desired length)	316L 303 MONEL HASTETLOY INCONEL 304L 410 ALLOY

1-3) Research Achievements

- Paper : "Comparative Study on Rolling Characteristics of Hexagonal Bar with Special Alloy for Advancing Drawing System"
(Journal of the Korean Society of Manufacturing Process Engineers, May 2021. Published Paper)
- Paper : "Analysis on Characteristics of Drawing Plastic Deformation for Rectangular Monel Material with Special Alloy and Rollers"
(Journal of the Korean Society of Manufacturing Process Engineers, October 2022. Published Paper)
- Paper : "Analysis on Characteristics of Drawing Plastic Deformation for Rectangular Monel Material with Special Alloy and Rollers"
(Journal of the Korean Society of Manufacturing Process Engineers, December 2022. Published Paper)
- Paper : "Analysis on Characteristics of 4 Stage Rolling and Reaction Force for Special Alloy Monel Material with Hexagonal Bar"
(Journal of the Korean Society of Manufacturing Process Engineers, June 2023. Published Paper)
- Paper : "Structural Analysis on Turning Wheel using Reaction Force of Rolling Roller for Special Alloy Monel Material with Hexagonal Bar"
(Journal of the Korean Society of Manufacturing Process Engineers, 2023. 08. Published Paper)



[Published Papers on Products]

1-4) Industrial products utilizing molded components

- These molded components are processed and used as materials for valves and fittings applied in semiconductor machinery, chemical plants, LNG vessels, offshore plants, and onshore plants.



[Processed products utilizing molded components]

2.3 Shipbuilding

1) Shipbuilding

○ High Power Suitable for Large Structure Processing

- **Strong Pressure** : Hydraulic systems utilize high pressure to bend or form thick steel plates.
- **Large Plate Forming** : Bow and stern structures often have curved or asymmetric shapes, which can be accurately processed using hydraulic presses or benders.
- **Continuous High Output** : Capable of maintaining consistent force over long periods, making it advantageous for manufacturing large structures.

○ Flexibility Favorable for Complex Shape Production

- **Curved Surface Forming Capability** : Hydraulic machines can gradually increase pressure to naturally form complex curves and twisted shapes.
- **Use of Various Dies** : A variety of shapes can be produced by using easily interchangeable hydraulic dies.
- **Automated Forming Possible** : With CNC and hydraulic control systems, bow and stern curvatures can be precisely manufactured.

○ High Precision and Stability

- **Accurate Dimensional Control** : Hydraulic machines' precision control systems reduce dimensional errors.
- **Consistent Quality** : Hydraulic forming and bending ensure uniform quality in repeated operations, maintaining symmetry in structures.
- **Servo Control Applicable** : Servo hydraulic systems allow for more precise position and force control.

○ Improved Efficiency and Processing Speed

- **Fast Processing Time** : Hydraulic presses and benders can shape materials in one stroke with powerful pressure, increasing work speed.
- **Suitable for Mass Production** : Large blocks or panels can be processed at once, greatly enhancing productivity.
- **Integration with Automated Lines** : In large structure manufacturing, hydraulic machines can be linked with automation systems to shorten production processes.

○ Enhanced Safety and Worker Protection

- **Load Control Function** : Automatically reduces pressure when excessive force is applied, preventing damage to structures.
- **Emergency Stop Function** : Hydraulic machines can immediately cut off pressure in emergency situations to prevent accidents.
- **Reduced Vibration** : Compared to electric motors or mechanical equipment, hydraulic drive systems produce less vibration, reducing worker fatigue.

2) Shipbuilding-related Machinery Manufacturing Achievements

Equipment Name	Content	Photo	Equipment Name	Content	Photo
Tandem Press Brake	Goalocation Work		Vertical Roll Bending Machines	Ship Subcomponent Bending	
T-BAR Bending Machine	T-BAR Bending Tool		Edge R Press	R Work for Both Sides of Cut Products	
RT Press	For Bow and Stern Work of Ships		Edge R Press	Mold	



○ **Bending Machine Design & Manufacturing**

- Servo System Tandem Press Brake Machine

: Press technology for ship structure processing, including 2,500 TON × 16M and 3,000 TON × 18M models.



Delivery to Geonhwa Co., Ltd.
(PRESS BRAKE M/C 2,500TON × 16M)



Delivery to GM Co., Ltd.
(PRESS BRAKE M/C 3,000TON × 18M)

○ **T-Bar, ship bow, stern work machinery**

- **Bow and Stern Work Machinery for Ships**

: Improvement of navigation performance, optimization of weight distribution, steering and control systems, as well as enhancement of speed and fuel efficiency.



T-Bar
Bending Machine for Operations



RT Press
(For Bow and Stern Work on Ships)

2.4 Construction and Automobile · Heavy Equipment

1) Construction

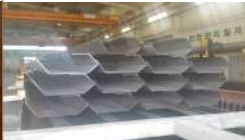


1-1) Construction Machinery Manufacturing Achievements

Equipment Name	Content	Photo	Work-related	
Press Brake	T-beam Work			
Shearing Machine	Steel Plate Cutting			

2) Automobile · Heavy Equipment



Equipment Name	Content	Photo	Work-related	
Tandem Press Brake	Dump Truck Cargo Bed			
Small Press Brake	For Heavy Equipment			