

# Quotation

For

Expansion Project of IKPT's Seamless Pipe Production Line



Jan. 21,2023

## **I. Summary**

### **1. Brief Description of the Project and Process Flow**

#### 1.1 Brief Description of the Project

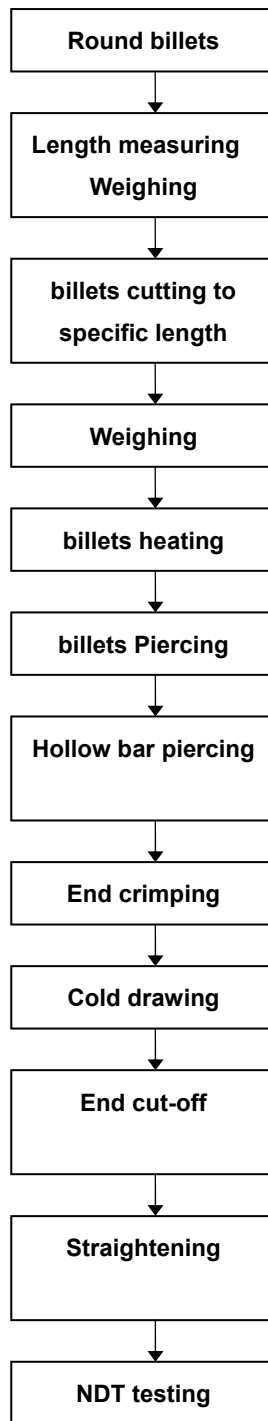
The Expansion project is to combine the existing facilities like 10.5m RHF/Piercing mill 90/ 200 tons of end crimping machine and new facilities like piercing mill/150tons cold drawing machine/ straightening machine for producing seamless pipes with the max. OD of 168.3mm pipes. The technology adopted by this project is mature and cost-saving which has been proven by many seamless pipe plants established in China.

The production equipments of the line are mainly composed of the following 7 sections:

- 1) Rotary furnace (existing)
- 2) Piercing mill 90 (existing)
- 3) Piercing mill (new)
- 4) 200 tons of end crimping machine(existing)
- 5) 150tons cold drawing machine(new)
- 6) End Cut-off
- 7) Straightening machine(new)

Seamless pipes produced by this line can be used as line pipe(API 5L), liquid pipe, structural pipe, etc.

### **2. Process Flow Chart**



## II. Technical part

### 1. Piercing mill for second piercing production

#### 1.1. Main Parameters

##### 1.1.1 Hollow bar before entering the second piercing mill

- 1) OD:  $\Phi$  130~154 mm
- 2) Wall thickness: 8~16mm
- 3) Length: 4700~8000mm

##### 1.1.2. Hollow bar after the second piercing mill:

- 1) OD:  $\Phi$  150~180 mm
- 2) Wall thickness: 6~12 mm
- 3) Length:  $\leq$ 10000 mm

##### 1.1.3. Specification of the second piercing mill:

- 1) Q'ty: 1 set
- 2) Rolls type: barrel-type
- 3) Roller diameter: 700mm
- 4) Roller length: 560mm
- 5) Roll's material: No. 55 steel
- 6) Feed angle: 9°(fixed)
- 7) Roller rotary speed: 102r/min
- 8) Steel grade of round billet: Common carbon steel and low alloy steel
- 9) Main motor
  - Power: 1000 KW x 1
  - Type: DC
  - Voltage: 660V
  - Rotary speed: 810 r/min
- 10) Main gear reducer:  $i=3.68$
- 11) Material of gears of reducers: 42 CrMo , Gears of reducers should be heat treated and grinded.
- 12) Centering (steadier) stands: 6 rolls
- 13) Plug bar carriage motor
  - Power: AC 22.0 KWx 1
  - Type: AC

- Max. speed of plug bar carriage: 2.2m/s
- 14) Thin oil lubrication station: XHZ-63
- 15) Work pressure of hydraulic system: 12Mpa
- 16) Total weight: about 100tons

**1.2. Composition list**

No.	Description of equipments
1	Conveyor(roller way) and tables before and after piercing mill(based on General layout)
2	Inlet side
3	Main mill base
4	Main transmission
5	Outlet side (section 1)
6	Outlet side (section 2)
7	Main motors and Motor of plug bar carriage
8	Electrical control system
9	Hydraulic system with soft tubes piping sestem
10	Lubricating system
11	Water cooling system
12	Tools and Dies (supplying plug head and guide board for hollow bars' performance test-run, the sizes shall be confirmed by both sides)
13	PLC system

**1.3. Vendors of Core Components**

- 1) Main motor and plug bar carriage motor will use products from Jiangsu Dazhong or Hangzhou Hengli Electric Machine MFG. Co., LTD (As per Seller's final option).
- 2) Main reducer will use product from Ningbo Dongli Reducer Group Co., LTD. or Jiangsu Taiyu Reducer Co., LTD (As per Seller's final option).
- 3) ZWZ bearings shall be applied to work rolls and plug bar carriage (As per Seller's final option).

- 4) Siemens 6RA80 module shall be applied to DC speed regulating in main transmission system. Siemens module shall be applied to DC speed regulating in plug bar carriage.
- 5) Switch in control cabinet will use product from Schneider Electric, Cooperate.
- 6) Relay in control cabinet will use product from Weidmuller or Siemens.
- 7) Fuse in control cabinet will use product from Xian Fuse Co., LTD. or Shanghai Ceramic Electrical Apparatus Works Ltd
- 8) Siemens 7-300 module shall be applied to PLC system.
- 9) Siemens SIMATIC WINCC operation program and Samsung operation screen shall be applied to HMI.
- 10) Hot-metal detector will use product from Changzhou Lucheng Sensor Co., LTD.
- 11) Pressure flow valve and control valve will use products from Beijing Huade Hydraulic Industrial Group Co., LTD.
- 12) Oil pump will use product from Beijing Huade Hydraulic Industrial Group Co., LTD.
- 13) High-low ball valve will use product from Yancheng Zhongye Hydraulic Component Co., LTD.
- 14) Accumulator will use product from Fenghua Aolaier Hydraulic Co., LTD.
- 15) Cylinder will use product from Yuci Gaohang Yeya Co., LTD
- 16) Oil return filter will use product from Leemin Hydraulic Co., LTD.
- 17) Manometer(Pressure gauge) will use product from Wuxi Pressure Gauge Co., LTD.
- 18) Pressure relay will use product from Beijing Huade Hydraulic Industrial Group Co., LTD.
- 19) Liquid level meter will use product from Leemin Hydraulic Co., LTD.
- 20) Temperature controller will use product from Liaoyang Wensheng Yibiao Co., LTD.

## **2. 150T Cold drawing machine**

**2.1. Main Parameters**

- 1) Q'ty: 1 set
- 2) Type: chain
- 3) Rating drawn force: 1500 KN
- 4) Max. OD of finished pipe: 168.3mm
- 5) Drawn speed: 3-12m/min
- 6) Max. length of pipe before drawing: 8m
- 7) Max. length of pipe after drawing: 12m
- 8) Max. speed of Return carrier: 40m/min
- 9) Main speed reducer:
  - Model: DLH-100
- 10) Main motor:
  - Type: DC Motor Z4-355-22
  - Power: 400KW x 1(440V)
  - Rotary speed: 400r/min
- 11) Return carrier motor:
  - Type: AC Motor YZR132M2-6
  - Power: 11KW x 1
  - Rotary speed: 960r/min
  - Return speed: V=40m/min
- 12) Mandrel carrier motor:
  - Type: AC Motor YZR132M2-6
  - speed: V=60m/min
  - Rotary speed: 960r/min
- 13) Total weight: about 140tons

**2.2 Composition list**

No.	Description of equipments
1	Main transmission

2	Driving chain gear assembly
3	Driven chain gear assembly
4	Drawing die stand
5	Bench assembly
6	Carriage assembly
7	Carriage return mechanism
8	Electrical control system

### 2.3. Vendors of core components

- 1) Main motor and plug bar carriage motor will use products from Jiangsu Dazhong or Hangzhou Hengli Electric Machine MFG. Co., LTD (As per Seller's final option).
- 2) Main reducer will use product from Ningbo Dongli Reducer Group Co., LTD. or Jiangsu Taiyu Reducer Co., LTD (As per Seller's final option).
- 3) ZWZ bearings shall be applied to work rolls and plug bar carriage (As per Seller's final option).
- 4) Siemens 6RA80 module shall be applied to DC speed regulating in main transmission system. Siemens module shall be applied to DC speed regulating in plug bar carriage.
- 5) Switch in control cabinet will use product from Schneider Electric, Cooperate.
- 6) Relay in control cabinet will use product from Weidmuller or Siemens.
- 7) Siemens 7-300 module shall be applied to PLC system.

### 3. Straightening machine

#### 3.1 Main Parameters

- 1) Q'ty: 1 set
- 2) Type: 6-roll (2-2-2), cross- roll, vertical
- 3) 6 rolls, main drive:
  - Motor type: DC
  - Q'ty: 2 sets
  - Power: 90KW



- 4) Straightening precision of pipe body:  $\leq 1 \text{ mm}/1.5\text{m}$
- 5) Yield limit of tube to be straightened:  $\leq 690\text{MPa}$
- 6) Specification of tube to be straightened
  - Tube OD range: 80-168.3mm
  - Tube wall thickness: 5-12mm
  - Length range of Tubes: 6-12.5m
- 7) Max. straightening speed: 1.5 m/s
- 8) Angle adjusting range of straightening roller:  $31\pm 3^\circ$ 
  - Adjusting way: Electrical adjust(0.55KWx 6 sets)
  - Locking way: Hydraulic locking
- 9) Straightening roll distance: 830 mm
- 10) Straightening roll material: High Cr alloy
- 11) Throat diameter of roll: 365mm
- 12) Length of roll: 440mm
- 13) Total weight: about 65tons

**3.2 Composition list**

No.	Description of equipments
1	Main transmission
2	Inlet side
3	Main body
4	Outlet side
5	Hydraulic system with soft tubs piping system
6	Electrical control system
7	Configured with 6 PCS of rolls.

**3.3 Vendors of core component**

- 1) 2 sets main motor choose Jiangsu XingYang or Hangzhou HengLi Motor.(Final choice decided by Seller)
- 2) 2 main reducers choose Ningbo DongLi or Jiangsu JinXiang.(Final choice decided by

Seller)

- 4) DC speed governing system of main transmission choose Siemens.
- 5) Switch of control cabinet choose Schneider.
- 6) Instrument of control cabinet choose Shanghai APT.
- 7) Relay of control cabinet choose Weidmuller or Siemens.
- 8) Fast fuse of control cabinet choose Xi'an Fuse or Shanghai Electrical Ceramics.
- 9) PLC system choose Siemens 7-300 module.
- 10) Human-computer interface HMI choose Siemens SIMATIC WINCC running program and Samsung operation interface.
- 12) Proximity switch and encoder choose Koyo(Wuxi).
- 13) Pressure flow valve, control valve and oil pump choose Beijing HuaDe.
- 14) High and low ball valve choose Yancheng ZhongYe Hydraulic parts Co.,LTD.
- 15) Energy accumulator choose Fenghua AoLaiEr Hydraulic Co.,LTD.
- 16) Return oil filter choose LiMing YeYa Co.,LTD.
- 1) Pressure gauge choose Wuxi Manometer Co.,LTD.
- 2) Pressure relay choose Beijing HuaDe.
- 3) Oil level gauge choose LiMing YeYa Co.,LTD.
- 4) Temperature controller choose Liaoyang WenSheng instrument Co.,LTD.

#### **4. Ultrasonic tester**

##### **4.1 Main Parameters**

- 1) Q'ty:1 set
- 2) Main requirements of tubes to be detected
  - Tube OD:  $\Phi 60.3\text{mm}-\Phi 168.3\text{mm}$
  - Tube length:6-12m
  - Wall thickness: 3.68-18mm
  - Raw material of Tube: hot rolled, normal carbon steel, alloy steel
  - Wall thickness deviation:  $<\pm 12.5\%$  of Nominal wall thickness
  - OD tolerance:  $<\pm 1\%$  of Nominal OD
  - Ratio of wall thickness to OD:  $\leq 0.20$

-Straightness:  $<1.5/1000\text{mm}$

-Requirement on pipe surface condition: plain ends, No loose scales, burr, scrap iron and oil grease on the surface

#### 4.2 Main Parameters of Ultrasonic testing

- 1) Detection mode: Water immersion coupling, pipes do linear motion without rotation while detecting carriers do rotational motion.
- 2) Probes arrangement: 28 channels (8 channels perform longitudinal defect testing in two directions, 12channels perform transverse defect testing in two directions and 8 channels perform wall thickness testing and lamination detecting)
- 3) Surplus sensitivity  $\geq 60\text{dB}$  Resolution  $\geq 32\text{dB}$
- 4) Vertical linearity  $\leq 2.5\%$ ; Horizontal linearity  $\leq 1\%$
- 5) Circumferential sensitivity difference:  $\leq 3\text{dB}$
- 6) Signal-to-noise ratio:  $\geq 8\text{dB}$
- 7) Inner and external wall sensitivity difference:  $\leq 4\text{dB}$
- 8) Stability:  $2\text{dB}$
- 9) Rate of missing report:  $0\%$
- 10) Rate of false alarm:  $\leq 1\%$ (after two-hour continuous working)
- 11) Maxi. Detecting speed:  $0\text{-}30\text{m/min}$ (speed adjustable)
- 12) Non-detecting length of pipe ends:  $\leq 200\text{MM}$
- 13) Action when finding the defective tube: sending signal of acousto-optic warning
- 14) Statistic record: showing the quantity of defective tubes in the monitor.
- 15) Recording, saving and printing out the detecting results: available
- 16) Requirements on workshop
  - a) Electrical conditions:
    - Power:  $220\text{V} \pm 10\%$ ;  $50\text{Hz} \pm 2\text{Hz}$ ,  $5\text{kVA}$ ;
    - Power:  $380\text{V}/220\text{V} \pm 10\%$ ;  $50\text{Hz} \pm 2\text{Hz}$ ,  $45\text{kVA}$ ;
    - Ground wire: Resistance to ground  $< 2\Omega$
    - Two independent grounding devices ( $1\Omega$ ) are available and one  $220\text{V}$  non-drive power available;

- b) Compressed air:
  - Pressure: 0.4-0.6Mpa
  - Maxi. Consumption: 5m<sup>3</sup>/h
- c) Water supply
  - Circulation water
  - Pressure: 0.4-0.6Mpa

**4.3 Composition list**

No.	Description of equipments
1	Detecting main stand(including lifting table, centering unit, UT Probe rotation unit)
2	Charging & discharging racks and kick-off unit
3	Front conveying roller way & Rear conveying roller way
4	28 channel ultrasonic detecting instrument
5	Electrical control system
6	Probe rotating main device
7	longitudinal probes; Thickness measuring /lamination detecting probes transverse probes;
8	Marking device
9	Water blowing unit
10	Bend pipe stopping unit
11	Pre-spray unit
12	Press roll unit
13	Circulating water tank system of automatic water supply

**4.4 Vendors of Core Components**

- 1) Motor: Yutong
- 2) Bearing: Herbin/ZWZ/LY
- 3) Air cylinder/ solenoid valve: Yadeke/ Suonuo
- 4) Transverse focusing combination probes are provided by Changzhou Changchao Electronic Research Institute Co., Ltd
- 5) Siemens PLC module S7-200 shall be applied to PLC system.
- 6) Main motor and gear box will use products from Taiwan Zhibao Motor Co., LTD.
- 7) Frequency converter will use products from Siemens

- 8) Circuit breaker and contactor in control cabinet will use product from Schneider.
- 9) Relay and proximity switch: from Omron

**III. Commercial part**

**1. Commodity: Seamless Pipe Production Equipments**

No.	Description of equipments	Q'ty		U/P		Amount
				FOB Chinese Main Ports		
1	Piercing mill for second piercing production	1	SET	CNY	4,380,000	4,380,000
2	150T Cold drawing machine	1	SET	CNY	2,980,000	2,980,000
3	Straightening machine	1	SET	CNY	1,980,000	1,980,000
4	Ultrasonic tester	1	SET	CNY	2,200,000	2,200,000
<b>5</b>	<b>TTL</b>			<b>CNY</b>		<b>11,540,000</b>

**2. Price in total: CNY 11,540,000, FOB Chinese Main Ports**

If Eddy current tester is required to combined with UT, the additional cost of CNY 250000 shall be added.

2.1 The charges of supervision on Erection, Commissioning and Performance Test-Run will be stipulated in the separate Agreement.

2.2 Contract Equipment is composed of some separate equipments, machines, electrical equipments and instruments. For each of these equipments, machines, electrical equipments and instruments, on which Seller shall provide and mount necessary length of control cables, pipes. For the connections among these separate equipments, machines, electrical equipments and instruments, the Buyer shall provide the control cables and pipes and doing the connection work. The length of control cables and pipes which will be used for connecting is up to the position of those separate equipments, machines, electrical equipments and

instruments, where they are installed. Seller shall provide the relative parameters of control cables and pipes in advance and give guidance in the period of doing connection work.

**3. Packing:** suitable for marine transportation.

**4. Delivery time (at Chinese Main Port, China):** 120-180 days after reception of the down payment.

**5. Shipment:** From Chinese Main Ports to IR BSR/BND/PERSIAN GULF Port, Iran

**6. Terms of Payment:**

The 100% of the total Contract value shall be paid by T/T before shipment.

6.1 30% of the contract value shall be paid as down payment within 30days after the contract is duly signed.

6.2 30% of the contract value shall be paid within 60days as progress payment after the down payment during the production.

6.3 35% of the contract value shall be paid before the shipment.

6.4 5% of the contract value shall be paid within 12 months after the commissioning.

**7. Price validity:** it is valid until March 31, 2023