Longitudinal Seam Submerged Arc Welding Pipe Mill

TSD

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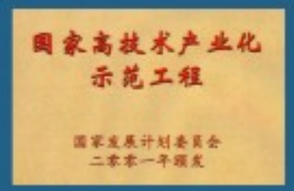
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In June, 1997, Chinese State Council Vice-Premier Zou Jiahua (middle) visited our company.



In July, 2008, formerly Chinese Ministry of Industry Machine Minister He Guangyuan (second from right) and Lu Yuesun (second from left) visited our company.



In April, 2007, Gansu Province Governor Xu Shaolong(middle) visited our company.

Brief Introduction

Tianshui Metalforming Machine Tool Co., Ltd（TSD）is located in Maiji District, Tianshui City,Gansu Province,China, which is one of famous national historical and cultural cities. It is honored as Former Residence of Fuxi with 8000 years history.

In 1966, Tianshui Metalforming Machine Tool Works was established as the key national company in Chinese national third five-year plan period (1966-1970 year) , marking the state-owned second large company. It is one of the foreign trading bases for mechanical and electrical products. In 2002, it was restructured into state-holding Tianshui Metalforming Machine Tool Co., Ltd.

The company has always been manufacturing and distributing shears, press brake, hydraulic press, rolling machine as well as Turn-key project of JCOE Longitudinal Sub-merged Arc Welding (LSAW) pipe mill, including 5 major kinds, 20 series and more than 200 specifications. The products manufactured are widely employed in field of Machinery Manufacturing, Metallurgy, Petrifaction, Electrical Power, Wind Power Generation, Aerospace, National defense and military industry, Auto-industry, Railway, Shipbuilding, Natural gas and oil transportation. TSD machines have been exported to more 40 countries and regions.

The company's R&D center is awarded as National R&D Center, Gansu Provincial Research Center for Pipe manufacturing and Metal forming engineering. There are more than 200 senior and semi-senior engineers, 1 Outstanding Science expert of Gansu province, 2 Pro. Senior Engineers. There are nearly 1000 employees with 300,000m² floor space, 120,000 m² construction spaces, among which 50,000 m² manufacturing space, 400 sets of processing machines with more than 60 sets of heavy duty precise processing equipment.With registered trade mark TSD, it is hnored as Chinese famous trademarks. TSD has always been contributing to "national Hi-tech industrialization demonstration projects", National "863 plan" project, and the state Torch Plan Project. TSD has been awarded more than 40 items of National, Provincial and Municipal Prizes for Progress in Science and Technology, and 63 patents of national invent and utility model.

The company is the council member of China Machine Tool and Tool Builder's Association(CMTBA), CMTBA's Metal Forming machine tools sub-association and China Mechanical Engineering Society as well as the committee member of National Committee for Standardization Techniques of Metal Forming machinery.

The company is honored as one of top 10 companies of nationwide metal processing innovation capacity, the National May Day Medal Winner, one of top 10 self-innovation enterprises awarded by CMTBA, also awarded as most innovative company, advanced technological innovation company etc.

It has got ISO9001 1994 in 1997 and ISO9001 2000 in 2001 quality management system certification, and ISO14001 1994 environmental management system certification and OHSAS18001 1999 occupational health and safety management system certification in 2008.

We are always devoting ourselves to "Quality First, Customer First" principles and keeping our promises for quality, striving for offering products with excellent quality, and we are very pleased to cooperate with friends from all over the world and always achievingco-development.

Complete,Fast and First-Class Service

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Application

The products are mainly used for manufacturing large diameter longitudinal seam submerged arc welding pipes, whose forming method is JCOE forming method. The pipes are widely used in the industry of oil, gas, water, heat supply, coal, mine slurry, paper-making and architecture etc.





Mill manufacturing range

Pipe diameter: ϕ406～ϕ1422mm
Pipe length: 8000-12200mm
Wall thickness range: 8～50mm
Plate width: 1270～4500mm
Max. Plate length:12,200mm
Max.plate weight:21000kg
Steel grade: Q235A, Q345, X42-X80
Max. wall thickness for each steel grade
Q235A:50mm
Q345,X42,X52,X60,X65:40mm
X70: 32mm
X80: 25.4mm
Applicable standards: ISO3183-3, API 5L Spec 5L, GB/T9711.1, GB/T9711.2
Forming method: JCOE
Pipe accuracy:
Roundness tolerance:±1%;
Straightness deviation in full length of pipe ≤0.22%
Production capacity:50,000～150,000 t/a

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Main manufacturing machines

Main manufacturing machines for Construction pipe

- plate edge milling machine
- plate crimping press
- pipe forming press
- tack-welding machine
- pipe inside welding machine
- pipe outside welding machine
- pipe calibrating press
- pipe straightening press
- pipe end facing machine
- auxiliary equipment

Main manufacturing machines for Oil & Natural gas transportation pipe

- plate UT tester
- plate edge milling machine
- plate edge deruster
- plate crimping press
- pipe forming press
- tack-welding machine
- pipe inside welding machine
- pipe outside welding machine
- welding seam ultrasonic tester
- X-ray tester
- pipe mechanical expander
- pipe hydrostatic tester
- pipe end facing machine
- pipe calibrating press
- pipe straightening press
- pipe cross-transfer carriage
- pipe seam cleaning device
- pipe welding seam X-ray tester
- auxiliary device before forming
- auxiliary device after forming
- pipe inside cleaning unit
- plate magnet hoister
- pipe welding seam smooth machine
- measuring, weighing & marking device

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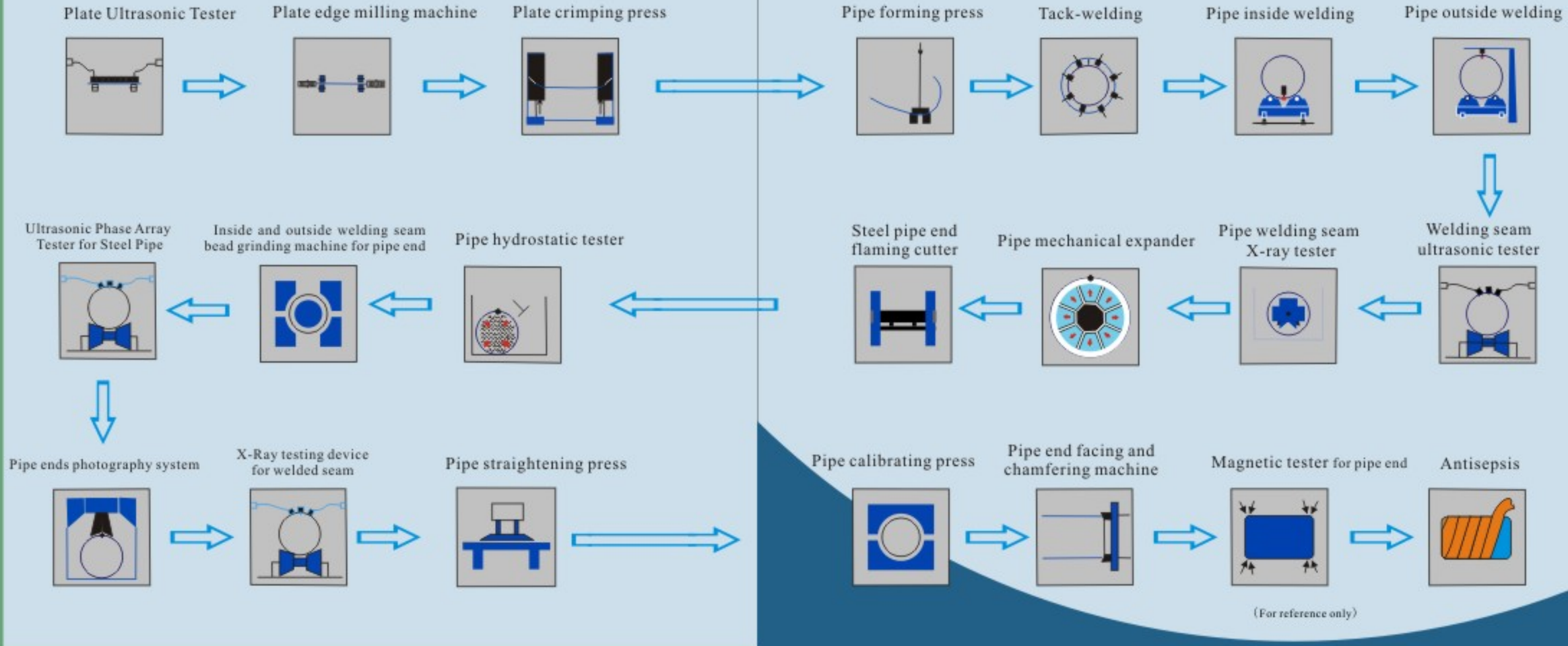
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Mill Process Layout

Mill Process Layout of Oil &Natural gas transportation pipe

Technological process



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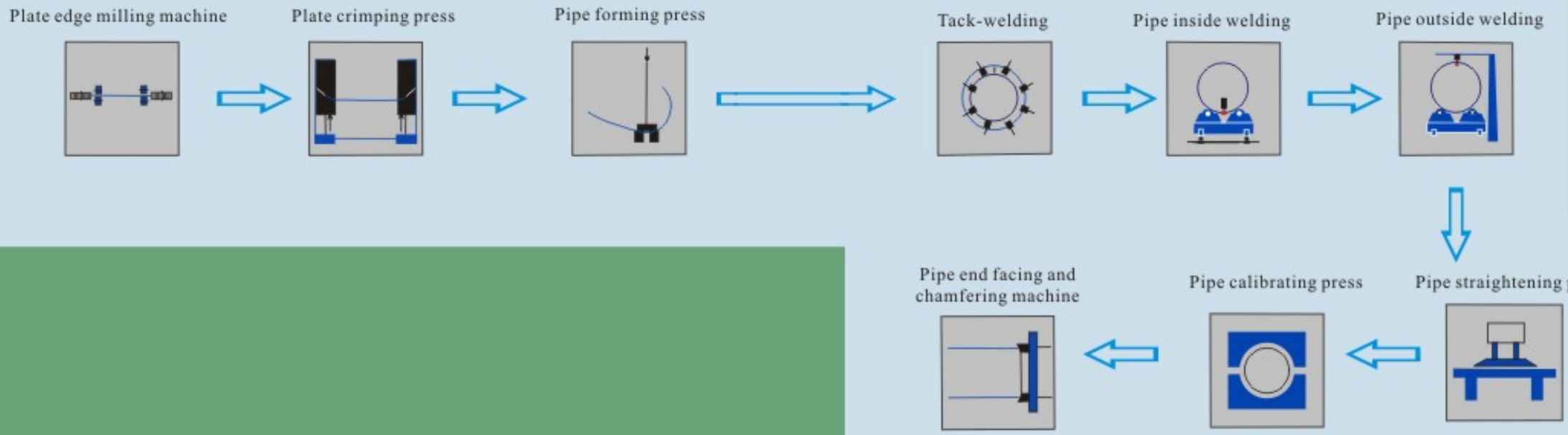
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Technological process of Construction pipe

Technological process of Construction pipe



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PCT Plate Ultrasonic Tester

The machine is a special detecting equipment for plate, consisting of feeding rollers, watering device, side detecting frame, swaying testing frame, air blowing frame electrical system and detecting components. The machine marks an automatic defect detecting machine. Detectors are arranged along the short side of plate and can swing transversely. The plate longitudinally detecting process is finished by detector frame.

There are max. 40 detectors during normal working, while max 28 for interior plate at most and 3 for plate sides.

Detecting method: Pulse-echo.

Detecting items: To detect the lamination defect of plate, including the flaw inwide range, white flake and entrapped slag. The tester is mainly used for detecting the defect of plate before edge milling, whose detectors are made by the professional manufacturers.



Main Specifications

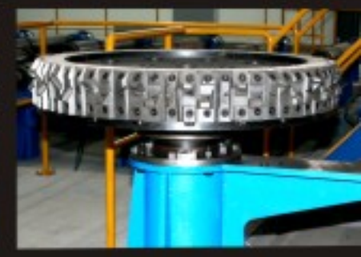
Name \ Model		PCT－4500×12200
Plate ultrasonic defect detector		40 channels
Type of detector		Crystal Straight detector
Plate length	mm	8000~12200
Plate width	mm	1200~4500
Detector		Using double crystal TR transducer to ensure the detecting of upper and lower dead zone is less than 2(mm)
Working speed	m/mim	3~18
Productivity	p/h	9~15
Applicable frequency for detector	MHz	1~10
Detecting range	mm	10~500
Horizontal linearity		≤1%
Vertical linearity		≤5%
Power of motor	kw	3
Overall dimensions(L×W×H)	mm	31500×7500×1700
Weight	kg	18000

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XB Plate edge milling machine

The machine is one of the five main machines for JCOE type LSAW mill, which consists of milling unit, sliding board, feeding centering roller frame, discharging roller frame and conveying carriage, electrical and hydraulic systems.

The machine delivers the steel plate to the stopper device at the side of milling unit by rollers, the plate is centered according to symcenter of milling units by the centering device, and then the conveying carriage griper clamps the plate at both ends at the front and rear of the carriage automatically and pulls it to the hold-roller of milling unit. During the transporting of plate, two milling units mill two edges of plate respectively. When milling is accomplished, carriage gripper falls below the plate and is retracts, the plate is carried to the next working procedure by the discharging rollers. High efficiency is one of the outstanding advantages of plate edge milling machine.



Main Specifications

Name \ Model		XB-2600	XB-4500	XB-5200
Mode of machine		Machine unit	Machine unit	Machine unit
Processing type		Continuous milling	Continuous milling	Continuous milling
Plate length	mm	8000~12200	8000~12200	8000~12200
Plate width	mm	1000~2600	1250~4500	1500~5200
Plate thickness	mm	6.4~22	8~50	8~50
Material		X70、X80、Q345	X70、X80、Q345	X70、X80、Q345
Machining allowance of single plate edge	mm	5~10	5~10	5~8
Processed plate edge shape		X type	X type	X type
Plate edges straightness after milling	mm	1/2000	1/2000	1/2000
Plate edges parallelism after milling	mm	1/1000	1/1000	1/1000
Milling unit		2	4	4
Diameter of milling cutter（㎜）	mm	Φ630	Φ800	Φ800
Sliding board	set	2	4	4
Carriage	set	1	1	1
Gripper	set	2	2	2
Feeding centering roller frame	set	33	34	34
Total power of motor	kw	220	510	530
Production efficiency	p/min	6~10	3~15	3~15
Overall dimensions(L×W×H)	mm	33000×8000×1800	38170×13900×3290	38170×13900×3290
Weight	kg	155000	260000	280000

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CNC plate crimping press

The machine is one of the five main machines for JCOE type LSAW mill, which is especially used to crimp both edges of plate.

The crimping press consists of C-frames, oil cylinder units, lower tool beam, transporting roller on frame, tool changing device, tools, tool moving device, pedestal, front and rear roller tables, electrical system, hydraulic and lubrication systems.

The machine is employed to pre-bend edges of plate before pipe forming, which is fed into upper and lower tools step by step after milling. The plate is bent by the pressing force produced between two tools. Changing and adjusting tools position can obtain the crimped edge whose curvature radius is very close to the curvature radius of finished pipe.Two presses are installed oppositely and synchronously pre-bend the plate laterally.

Function: The edge milled plate is crimped at both edges to form a curvature radius of plate edges close to curvature radius of finished pipe.



Main Specifications

Name \ Model		BWQ-300 /1500	BWQ-600 /1500	BWQ-1250 /3000	BWQ-1500 /3000	BWQ-2400 /3000
Nominal pressure	kN	3000	6000	12500	15000	24000
Length of tool	mm	1500	1500	3000	3000	3000
Crimping length per step	mm	800	800	2100	1800	2400
Feeding length per step	mm	600	600	1200	2100	2300
Clamping force	kN	560	560	2100	2100	4400
Plate thickness	mm	6~25	6~50	6~32	6~34	6~40
Material		Q235、Q345	Q235、Q345	Q235、Q345、X70、X80	Q235、Q345、X70、X80	Q235、Q345、X70、X80
Plate width	mm	1200~2600	1450~4500	1450~4500	1450~4500	1500~4500
Pipe diameter	mm	Φ508-Φ820	Φ508-Φ1422	Φ508-Φ1422	Φ508-Φ1422	Φ508-Φ1422
Crimping speed	mm/s	11	11	13	13	15
Return speed	mm/s	100	100	90	90	90
Clamping speed	mm/s	90	90	90	90	90
Motor power of main oil pump	kw	120	180	4×145	4×145	5×200
Overall dimensions(L×W×H)	mm	27300×10100×7300	27300×10500×7480	27300×10500×6755	33500×10500×7480	37426×10500×8865
Weight	kg	160000	172000	230000	250000	598000

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Pipe forming press

The machine is one of the five main machines for JCOE type LSAW mill, which consists of uprights, oil cylinder unit, ram, oil tank, beam, working table, crowning device, tools, hydraulic proportional servo system and electrical digital control system. The press has 3 axis for main machine and over 5 axis for auxiliary mechanism. The auxiliary mechanism includes longitudinal transporting device, side stopper, front and rear manipulators, front and rear supporters and side discharging device.

The CNC control is realized with Delem, Holland or Cybelec, Switzerland. The crowning device on working table can compensate the total elastic deformation of working table and ram under different forces to ensure the same bending angles both at ends or in the middle of workpiece.

The hydraulic system adopts electrical-hydraulic proportional system of BOSCH,Germany, which has high accuracy in synchronism, and strong anti-eccentric-loading capacity.



Main Specifications

Name \ Model		Double oil cylinders TDY37K-2500 1120×13000	Double oil cylinders TDY37K-3200 1120×13000	Double oil cylinders TDY37K-3600 1120×13000	5 oil cylinders TDY37K-5000 1730×14000	6 oil cylinders TDY37K-6600 1730×14000
Nominal pressure		25000	32000	36000	50000	66000
Working table length	mm	14000	14000	14000	14000	14000
Working table width	mm	1120	1120	1300	1730	1730
Side throat depth	mm	1800	1800	1800	1800	1800
Ram stroke	mm	400	400	400	600	600
Max. open height	mm	2310	2310	2590	2910	3000
Quantity of main oil cylinder		2	2	2	5	6
Approaching speed	mm/s	60	60	60	60	40
Working speed	mm/s	4	6	6	4	4
Returning speed	mm/s	45	55	55	54	30
Power of main motor	kw	110	2×90	180	460	600
Control axis		3	5	5	10	12
Overall dimensions (L×W×H)	mm	14780×5100 ×(8290upfloor +4190underfloor)	14774×5900 ×(8500upfloor +5000underfloor)	16632×6200 ×(8475upfloor +5400underfloor)	17000×15100 ×(9730upfloor +4320underfloor)	17000×16100 ×(10800upfloor +5200underfloor)
Weight	kg	42800	51500	58500	780000	960000

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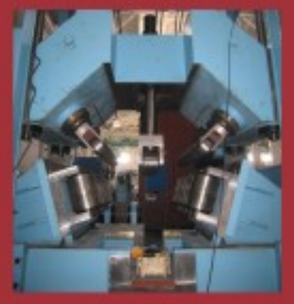
GYH Tack-welding machine

The machine is one of the five main machines for JCOE type LSAW mill, which makes an open seam pipe after forming into a closed pipe body ready for pipe inside and outside welding.

The tack welding machine consists of main linking machine and auxiliary mechanism, and it produces a continuous linking and tack welding over full length of pipe. Tack welding is carried out under an inert gas shield. Welding machine is supplied by the professional welding manufacturer.

The machine can be used to produce LSAW pipe for oil & gas transportation and construction pipe.






Main Specifications

Name \ Model		GYH-20/ 813×12200	GYH-50/ 1422×12200	GYH-26/ 1625×12400	GYH-32/ 1625×12200	GYH-50/ 1422×12200
Pipe line		Construction pipe line	Construction pipe line	Oil and gas pipe line	Oil and gas pipe line	Oil and gas pipe line
Pipe length	mm	8000~12200	8000~12200	8000~12200	8000~12200	8000~12200
Pipe diameter	mm	Φ394-Φ813	Φ508-Φ1422	Φ394-Φ1625	Φ219-Φ1625	Φ508-Φ1422
Wall thickness	mm	6~20	6.4~50	6.4~26.4	6~32	6~40
Material		Q235、Q345	Q235、Q345、X42~X70	Q235、Q345、X42~X80	Q235、Q345、X42~X80	Q235、Q345、X42~X80
Linking mechanism type		O-shape frame	O-shape frame	O-shape frame	O-shape frame	O-shape frame
Quantity of roller beam		5 groups	5 groups	9 groups	9 groups	9 groups
Welding technology		Mixed Co_2/Ar gas shielded	Mixed Co_2/Ar gas shielded	Mixed Co_2/Ar gas shielded	Mixed Co_2/Ar gas shielded	Mixed Co_2/Ar gas shielded
Tracking mode		/	Laser	Laser	Laser	Laser
Chain speed	m/min	1~6	2~6	0.5~8.9/11	1.7~20	1.7~20
Power of motor	kw	55	265	267	248	150
Overall dimensions (L×W×H)	mm	53000×7800 ×6000	57180×8288 ×7700	55000×11300 ×7700	55000×9000 ×7700	55000×9300 ×7700
Weight	kg	115000	172000	195000	182300	180000

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GNH pipe inside welding machine

The machine is used to weld the internal welding seam of pipe after tack welding. During welding process, pipe is transferred shock-free and vibration-free on a transfer carriage in order to produce a constant welding seam with good quality. The internal welding machine is designed as cantilever beam structure. Welding electrodes, wires, welding flux and welding current are supplied to weld seam by cantilever beam of internal welding machine. The offset of transfer carriage exceeds the length of cantilever beam. The end of cantilever beam is installed with welding device. The cantilever beam is inside pipe body. When transfer carriage retracts at a welding speed, inside seams are welded on the machines working on basis of the submerged arc welding technology.



Main Specifications

Name \ Model		GNH-50/1422×12200	GNH-50/1460×12200
Mode of welding		Automatic arc welding	Automatic arc welding
Pipe diameter	mm	Φ360~Φ1422	Φ360~Φ1460
Wall thickness	mm	X80≤40; Q345≤40	X80≤40; Q345≤50
Welding length	mm	8000~12200	6000~13000
Material	mm	Q345, X42~X80	Q345, X42~X80
Welding Wire number		2~4	2~4
Welding Wire diameter	mm	Φ3.2~Φ4.0	Φ3.2~Φ4.0
Welding speed(variable frequency speed control)	m/min	0.5~0.3 Stepless speed regulation	0.5~0.3 Stepless speed regulation
Carriage speed (variable frequency speed control)	m/min	0.5~25 Stepless speed regulation	0.5~25 Stepless speed regulation
Carriage power	kw	18.77	18.9
Speed of turning roller	m/min	0~9.9 Frequency control of motor speed	4.55
Welding seam precision	mm	Longitudinal welding: ±0.5 Vertical welding: ±0.5	Longitudinal welding: ±0.5 Vertical welding: ±0.5
Lifting height of cantilever	mm	≥200mm	≥200mm
Lifting height of earthing device	mm	≥1500mm	≥1500mm
Retreating distance of machine	mm	≥20000mm	≥20000mm
Fluctuation of current and voltage		Current≤1%, Voltage≤7%	Current≤1%, Voltage≤7%
Welding method		Fixed welding point and moving pipe	Fixed welding point and moving pipe
Adjusting range of current	A	DC240~1500A AC240~1200A	DC240~1500A AC240~1200A
Adjusting range of voltage	V	DC24~46V AC24~44V	DC24~46V AC24~44V
Production efficiency	pcs/min	1/12	1/12
Overall dimensions(L×W×H)	mm	31000×5000×3500	31000×5000×3500
Weight	kg	28000	28000

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GWH Pipe outside welding machine

The machine is used to weld the outside welding seam of pipe. In the process of outside welding, pipe is transferred shock-free and vibration-free on a transfer carriage in order to produce a constant weld seam with good quality. The cross sliding guide is equipped to welding head position of welding machine, which can effect a micro-adjustment in horizontal and vertical direction in process of welding so as to control welding seam centering of welding head. Welding speed 0.12～1.2m/min.



Main Specifications

Name \ Model		GWH-50/1422×12200	GWH-50/1460×12200
Mode of welding		Automatic arc welding	Automatic arc welding
Pipe diameter	mm	Φ360~Φ1422	Φ360~Φ1460
Wall thickness	mm	X80≤40; Q345≤40	X80≤40; Q345≤50
Welding length	mm	8000~12200	8000~12200
Material		Q345、X42~X80	Q345、X42~X80
Wire number		2~5	2~5
Wire diameter	mm	Φ3.2~Φ4.0	Φ3.2~Φ4.0
Welding speed(variable frequency speed control)	m/min	0.5~3 Stepless speed regulation	0.5~3 Stepless speed regulation
Carriage speed (variable frequency speed control)	m/min	0.5~25 Stepless speed regulation	0.5~10 Stepless speed regulation
Carriage power	kw	18.77	18.9
Speed of turning roller	m/min	0~9.9 Frequency control of motor speed	4.55
Welding seam precision	mm	crossweld±0.5mm vertical weld±0.5mm	crossweld±0.5mm vertical weld±0.5mm
Lifting height of cantilever	mm	≥200mm	≥200mm
Lifting height of earthing device		≥1500mm	≥1500mm
Retreating distance of machine	mm	≥20000mm	≥20000mm
Fluctuation of current and voltage		Current≤1%, Voltage≤7%	Current≤1%, Voltage≤7%
Welding method		Fixed welding point and moving pipe	Fixed welding point and moving pipe
Adjusting range of current	A	DC240~1500A AC240~1200A	DC240~1500A AC240~1200A
Adjusting range of voltage	V	DC24~46V AC24~44V	DC24~46V AC24~44V
Production efficiency	pcs/min	1/12	1/12
Overall dimensions(L×W×H)	mm	32180×5000×3500	31000×5000×3500
Weight	kg	31000	31000

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ZFCT welding seam ultrasonic tester

The tester consists of upright post, horn, tracking system, probe frame assembly, electrical control system, inspecting system, water and pneumatic system, which serves to inspect the welding seam defect of pipe.



Main Specifications

Name / Model		ZFCT-50/1422×12200
Pipe diameter	mm	Φ508~Φ1422
Pipe length	mm	8000~12200
Wall thickness	mm	8~50
Material		X70≤40、X80≤28、Q345≤50
Detecting defects		Blow holes ,impurity,and delamination
Number of channels		20
Tracking range	pic	±100
Tracking precision	mm	±1.0
Dead zone at end of pipe	mm	≤100
Speed of UT	m/min	3~12
Returning speed	m/min	30
Motor power	kW	5.5
Power of servo motor	kW	0.75
Power of rotating and lifting motor	kW	2.2
Overall dimensions(L×W×H)	mm	2000×3500×4500
Weight	kg	17500

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FXT pipe welding seam X-ray tester

The machine consists of lifting cantilever, image intensifier, inlet and outlet roller of carriage, carriage body, rotating roller on carriage, carriage guide rail and its supporting seat, PLC and electrical control cabinet.

The machine can make X-ray testing to defect of welding seam, defect of material and flaw of material.



Main Specifications

Name \ Model		FXT-26/1422×12200
Pipe diameter	mm	Φ508-Φ1422
Pipe length	mm	8000~12200
Wall thickness	mm	X70≤40、X80≤28、Q345≤50
Power of main driving roller motor	kw	3×5.5
Moving speed of carriage	m/min	0~25
Carriage stroke	mm	14000
Power of rotating motor	kw	2×2.2
Linear speed of rotating roller	m/min	Double direction turning 8
Power of carriage moving	kw	7.5
Speed of carriage	m/min	Double direction 1~25 adjustable Speed Fluctuations≤5%
Positioning precision of carriage	mm	±200
Carriage rail distance	mm	1400
Overall dimensions(L×W×H)	mm	10700×1792×879
Weight	kg	11000

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TDT90 pipe mechanical expander

The machine is one of main machines for LSAW mill, which serves to mechanically expand LSAW pipes step by step with expanding head in order to ensure accurate roundness, straightness and dimensional accuracy of the pipes in accordance with the technical requirements, and relief the residual stresses.

The machine consists of power cylinder, horn drawbar, expander-head, horn support and carrying pipe carriage. The expanding head consists of a multi-faced wedge, addressed as cone, drawn by means of a draw bar into a set of circumferentially arranged expander jaws. They are forced against the inside wall of pipe which expands it to size and straighten it along the entire length. This method assures that the pipe is forced outwardly in a uniform fashion regardless of any differences present in the pipe material. The expansion ratio is 1～1.5% of diameter.



Main Specifications

Name \ Model			TDT90-1422/12200
Machine type			Machine unit
Expanding type			Mechanical expander
Pipe diameter			Φ508-Φ1422
Pipe length		mm	8000～12200
Wall thickness		mm	≤Φ559, δ=23; ≤Φ711, δ=28.6 ≤Φ762, δ=34; ≤Φ762, δ=40
Typical steel grade			X70 (API)
Expansion ratio			Range 0.8～1.5% Optimize range 1～1.12%
Pipe accuracy after expanding	Diameter tolerance	mm	$D^{+2}_{-0.75}$
	Out-of-roundness	mm	±≤0.25 D%
	Straightness	mm	≤0.2%
Production efficiency		pcs/h	8～10 (average)
Power of main motor		kW	1014.6
Overall dimensions(L×W×H)		mm	63000×13000×6000
Weight		kg	400000

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Steel pipe end flaming cutter

End flaming cutter is one of pipe end cutting devices used in straight seam welded pipe. The cutter adopt fixed pipe and movable carriage to cut end of pipe by rotative torch in accordance with center of pipe.



Main Specifications

Name / Model		Φ508~Φ1422
Effective Dia.	mm	Φ508~Φ1422
Effective wall thickness	mm	8-50
Max. speed	mm/min	700
Material		X42-X80
Quantity of torch		2 groups each at each end
Adjustable range of cutting torch	mm	0-550
Linear speed	mm/min	100-700
Effective stroke of rotative torch	mm	580
Cutting source		Oxygen gas, acetylene or dimethylmethane
Power supply		380V±10%
Cutting inclination	mm	±1.6
Speed of carriage	mm/min	233-2330
Weight	kg	4000

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LSAW PIPE MILL

TIANSHUI METALFORMING MACHINE TOOL CO.,LTD.





Y93 pipe hydrostatic tester

The machine consists of front pressing head and rear pressing head, main hydraulic cylinder, sealing head, upper and lower tension beams.

The machine serves to closed test for pipe. The front pressing head of machine pushed by the main hydraulic cylinder provides the pressure. The rear pressing head is installed on a carriage, and it is fixed with 4 Tension Beams by bolts as per different pipe length. At testing, two ends of pipe are sealed the end-face-seals. Firstly fill water in a low pressure, and then fill water in a high pressure by intensifier till the water pressure reaches the required pressure. The oil pressure of another main hydraulic cylinder rises synchronously till a set value to keep a dynamic balance with water pressure so as to check the leakage of pipe.



Main Specifications

Name \ Model		Y93-800/813	Y93-2000/1067	Y93-3000/1422	Y93-4000/1626
Nominal pressure		8000	20000	30000	40000
Pipe diameter	mm	Φ219-Φ813	Φ508-Φ1066	Φ406-Φ1422	Φ406-Φ1626
Pipe length	mm	8000~12200	7900~12200	8000~12200	8000~12200
Wall thickness	mm	5~12.7	6~32	6~25.4	6~35
Stroke of main oil cylinder	mm	1200	1500	1240	1260
Moving distance of back pressing head	mm	4800	4800	4800	4800
Max. Pressure of hydraulic system	mpa	25.4	28	27	26.1
Max. pressure of water pressure system	mpa	25.4	25	25	40
Approaching speed of main oil cylinder	mm/s	20	23	23	30
Returning speed of main oil cylinder	mm/s	25.4	38	39	50
Moving speed of back pressing head	mm/s	20~60	40~85	40~85	40~85
Power of motor	kW	140	396	485	545
Overall dimensions(L×W×H)	mm	19302×1724×4000	21320×10600×5300	21500×19400×5350	23200×8120×5750
Weight	kg	110000	310000	340000	460000

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LSAW PIPE MILL

TIANSHUI METALFORMING MACHINE TOOL CO.,LTD.





Inside and outside welding seam bead grinding machine for pipe end

The machine consists of Main machine, Grinding head device, Dedusting system, Water spray mist cooling system, Pneumatic system and Electrical system to grind the inside and outside welding seam bead of pipe diameterΦ508～1422mm. The main machine consists of Sliding bottom, Guide rail, Sliding Seat, Grinding carriage, Rail, Upright column, Cross sliding guide, Cross beam and Driving mechanism for X & Y axes. The axial travelling of cross beam is driven by Speed reducer, Pinion and rack and Variable frequency motor to satisfy the welding seam bead grinding requirements of different specification of pipes.

Inside welding seam bead grinding machine: 2 sets

Outside welding seam bead grinding machine: 2 sets



Main Specifications

- Pipe diameter Φ508~Φ1422 mm
- Wall thickness X70 ≤40㎜，Q345≤50㎜
- Typical steel grade Max.X80
- Pipe length 8000~12200mm（excluded tab plate）
- Max. Pipe weight 21t/pcs.
- Capacity:15,000t/a

Performance and specifications of machine

- Welding seam bead specifications:Width 15～30mm, Height 0.5～4.8mm
- Weld reinforcement of pipe welding seam bead after grinding：0～0.5mm
- Grinding length:200+300mm（machine capacity 500mm）
- Min. Height of inside grinding:+500mm
- Travelling range of single grinding carriage：4000mm
- Travelling speed of grinding carriage：4000mm/min
- Up-down travelling range of grinding head：550mm(Internal grinding); 1650mm(External grinding)
- Axial travelling range of grinding head：900mm（Max. machining range0～450mm）
- Up-down travelling speed of grinding head：0～850mm/min（variable frequency control）
- Axial travelling speed of grinding head：0~1250mm/min（variable frequency control）
- Grinding speed of welding seam bead：100~300mm /min
- Sanding belt linear speed：30.5m/s
- Surface roughness of welding seam bead after grinding：Ra≤3．2μm
- Power：15kw
- Pneumatic source：0.4～0.6Mpa
- Weight：3500kg
- Overall dim.(L×W×H)： Internal grinding machine 7000×1600×2850mm
  External grinding machine 7000×1600×3950mm

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LSAW PIPE MILL

TIANSHUI METALFORMING MACHINE TOOL CO.,LTD.





Ultrasonic Phase Array Tester for Steel Pipe

The machine includes uprights, cantilever, tracking device, testing head assembly, electrical system, testing system, water system and pneumatic system. It detects and tests the welding seam, heat affected zone and pipe end with ultrasonic wave to determine the accurate location, shape and size of the flaw.



Main Parameters

Name / Model		ZFCT-50/1422×12200
Length	mm	8000~12200
Dia.	mm	Φ508-Φ1422
Wall thickness	mm	8~50
Material		X70≤40、X80≤28、Q345≤50
Type of defect testing: air holes, impurity and layer		air holes, impurity and layer
Quantity of detection channels	set	24
Tracking range of detection channels	mm	±100
Tracking accuracy of detection channels	mm	±1.0
Dead zone of pipe end	mm	≤100
Speed of carriage detection	m/min	3~12
Returning speed of carriage	m/min	30
Motor power of carriage moving	kw	5.5
Motor power of Servo motor	kw	0.75
Motor power of screw conveyor	kw	2.2
Measurement	mm	2000×3500×4500
Weight	kg	17500

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LSAW PIPE MILL

X–Ray testing device for welded seam

TIANSHUI METALFORMING MACHINE TOOL CO.,LTD.

Mechanical parts of X-Ray tester

X-Ray carriage is installed in the X-Ray testing house in LSAW pipe mill, used to convey, rotate, feed and discharge the pipe during detection. There are 2 sets of carriages in total.

Main parameters

Dia.: φ508～φ1422mm
Wall thickness: X70≤40mm、X80≤28mm、Q345≤50mm
Length: 8000～12200mm
Max. weight of pipe: 21000kg
Motor power for carriage: 7.5kw
Speed of carriage: Bi-direction 1～25 m／min continuously adjustable
Effective stroke of carriage: 18000㎜
Positioning precision of carriage: ±200 mm
Motor power of rotating roller: 2×2.2kw
Linear speed of rotation roller: Bi-direction 8m／min
Motor power for pipe conveying rollers: 3×5.5kw



X-Ray testing image detection system

The machine is employed to X-Ray image detection for LSAW pipe, it includes: X-Ray unit, industrial TV, image processor, pipe conveying carriage, electrical control cabinet, site detection unit etc.



Main parameters:Applicable range:

Pipe length: 8000~12200mm
Dia.: Ø508mm~1422mm
Wall thickness: Max.40mm
Material: Up to X80
Detection speed: 2~7 m/min
Applicable standard of device: GB/T-19293-2003 Method of X-ray radioscopy for butt-weld
Pipe detection standard: API-5L 、GB/T9711

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LSAW PIPE MILL

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Pipe ends photography system

The machine is used to Pipe ends photography on file, which consists of Portable type X ray detector model HUARI-300HP, movable X ray machine carriage, fixed type movable carriage, electrical control system, X ray protection system and Monitor system on site.



Equipment and main specifications of Pipe ends photography system:

1、 Portable type X ray detector model HUARI-300HP:All parts except cover of controller are imported from YXLON,Germany.

- X ray tube ： ceramic-metal tube
- Power supply mode of X ray tube:Constant voltage
- Regulated voltage of X ray tube:50～300kV
- X ray tube current:0.5～3.0mA
- Max. power of X ray tube:900W
- Working frequency:100kHz
- Max. penetrating thickness: 65mm

2、 Movable X ray machine carriage and fixed type movable carriage

- X ray machines are installed at two ends of detecting room to make a photography detecting to pipe ends.
- Carriage overall dim.(L×W×H):1000×800×1800mm， Weight:500kg
- Carriage with X ray machine can move up and down along Y axis, whose stroke is 1200mm.
- Movable carriage can move 5000mm along X axis to satisfy the photography requirement of different pipes length .

3、 Electrical control system

- Console 1 set

4、 X ray protection system

- Large lead door of infeed pipe ： electric control， Overall dim(L×W) 2400×3000mm ； Weight 1000kg.
- Small lead door ： manual， Overall dim(L×W) 1000×2000mm ； Weight400kg。
- Control box of lead door: 1 set
- Alarm light of X ray ： red

5、 Monitor system on site ：

The system is used to observe the site environment and the position of pipe.

- Camera 1/2 〃 color 3 sets
- Monitor 15 〃 color 1 set
- Video Multiplexer color 1 set

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LSAW PIPE MILL

TIANSHUI METALFORMING MACHINE TOOL CO.,LTD.







TDW98Y pipe straightening press

The machine consists of fixed working table, gantry type moving frame, 5 groups longitudinal rollers, 2 groups rotating rollers, V type lower tool, hydraulic system and electrical system.

The 5 groups lifting longitudinal rollers, 2 groups lifting rotating rollers and 2 groups position-changeable V type lower tool are arranged on the fixed working table. The gantry type moving frame with main pressing head, main hydraulic station and the precise micro-drive device can move and position along the length direction of working table. At micro-drive operation, push the button one time, and the pressing head falls a constant stroke to ensure the optimum straightening performance. The pressing head can move to straighten the pipe over the full length of the pipe, and can straighten any position around pipe. The auxiliary hydraulic station is set at end of working table controls the lifting of 5 groups longitudinal rollers and 2 groups rotating rollers to support pipe to feed longitudinally and 360°turning.



Main Specifications

Name \ Model		TDW98Y-630/1422×12200	TDW98Y-1250/1422×12200
Nominal pressure	KN	6300	12500
Pipe diameter	mm	Φ406~ Φ1422	Φ508~ Φ1460
Pipe length	mm	12200	12200
Wall thickNess	mm	40	50
Moving distance longitudinally for gantry type moving frame	mm	10000	10000
Max. open distance left-right	mm	2500	2700
Max. stroke of pressing head down moving	mm	900	900
Power of main motor	kw	49	62
Overall dimensions(L×W×H)	mm	15450×5200×7689	15200×5500×8000
Weight	kg	95000	130000

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LSAW PIPE MILL

TIANSHUI METALFORMING MACHINE TOOL CO.,LTD.







TDW 96 pipe calibrating press

The main machine of pipe calibrating press is one down-stroke type with four columns press. 5 groups lifting transferring rollers and 2 groups lifting rotating rollers are arranged separately in the front and rear of main machine.
When the main machine is equipped with same size of tools in conformity with to be calibrated pipe, the pipe is segmentally transferred calibrated tools to accomplish pipe longitudinal full length and 360°circumference of calibration segmentally and successively.
Working principles: Apply the pressure from outside to the pipe to produce a solid flow for pipe material in the chamber of tools so as to achieve precise roundness of pipe.



Main Specifications

Name \ Model		TDW96Y-2000/1422×12200	TDW96Y-3000/1500×12200
Nominal pressure	KN	20000	30000
Working table length	mm	1650	1900
Working table width	mm	1800	2000
Max. distance between lower plane of movable cross-beam and upper plane of low cross-beam	mm	2120	2600
Max. up moving distance of movable cross-beam	mm	900	900
Max. up moving speed of movable cross-beam	mm/s	60	60
Max. up moving slowly speed of movable cross-beam	mm/s	7.8	7.8
Pressing speed	mm/s	1.85	1.85
Quick down speed	mm/s	102	102
Pipe diameter	mm	Φ508~ Φ1422	Φ508~ Φ1422
Power of main motor	kw	133	142
Overall dimensions(L×W×H)	mm	28000×8270×6225	28000×9800×9340
Weight	kg	16800	23500

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LSAW PIPE MILL

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GPD pipe end facing chamfering machine

The machine consists of headstock、base、cutter-head、clamping device、supporting、carrier roller、hydraulic system、lubricating system and electrical control system.
The machine serves to cut to length and chamfer for two ends of pipe. Two sets of cutting mechanism including sliding table and cutter-head are arranged face to face at two ends of pipe. The pipe is lifted after coming into the middle of two cutting mechanism, two sets of cutting mechanism synchronously finish the approaching, clamping and processing working to the pipe. Except the approaching of sliding table is driven by the rack and pinion pairs, other actions are driven by the hydraulic and electrical system with high automation and efficiency.



Main Specifications

Name \ Model		GPD-40/1422×12200	GPD-40/1524×12200
Pipe length	mm	8000~12200	8000~12200
Pipe diameter	mm	Φ508-Φ1422	Φ508-Φ1524
Wall thickness	mm	8~40	8~40
Diameter of cutter head	mm	Φ1900	Φ2000
Cutter quantity on cutter head	pcs	4	4
Fixed cutter quantity on each cutter head pcs(cutting length =30)		1	1-2
Rotating range of cutter head	r/min	15~80	15~80
Clamping type of pipe clamping device		Combined clamping by two hydraulic oil cylinders	Combined clamping by two hydraulic oil cylinders
Driving type of pipe lifting device		Combined lifting by two hydraulic oil cylinders	Combined lifting by two hydraulic oil cylinders
Total power of motor	kW	300	260
Working efficiency	pic/h	6-12	6-10
Overall dimensions(L×W×H)	mm	20200×8900×2800	20200×8900×2800
Weight	kg	180000	160000

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LSAW PIPE MILL

Automatic weigh and measuring device for pipe

The device is used to automatically weigh and measure the length for pipes, print the measuring report and store the measuring data, which can manage local database and communicate with the upper computer.



Main specifications:

Pipe diameter：φ508~φ1422 mm.
Wall thickness：8~50mm
Pipe length：8000~12200 mm
Max.pipe weight：0.8t~ 21.2 t/pcs.
Measuring length：7.5~12.7m
Measuring length accuracy：± 2mm
Weigh range：700~22000kg
Weigh accuracy：1‰ (Chinese national std.No.JJG539-97, Ⅲ grade scale)



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LSAW PIPE MILL

Pipe inside paint marking machine

The machine consists of painting marking system, painting head moving mechanism, which is characterized by simple construction and fast painting speed as well as clear and stable marking. The machine works reliably and safely.

Main specifications:

Pipe diameter: φ508mm~ φ1422mm
Pipe length: 8000~12200mm
Wall thickness: 8mm~50mm
Printed character height of paint marking machine: 40mm/line
Painting dot-matrix: 7×5, 9×7, 10×10, 16×10
Painting lines: 4 lines
Painting speed: 60m/min
30pcs./h
Moving length of platform: 6000mm
Overall dim.(L×W×H): 1200×1200×1200mm



Pipe outside paint marking machine

The machine consists of painting marking system, painting head fixed mechanism, which is characterized by simple construction and fast painting speed as well as clear and stable marking. The machine works reliably and safely.



Main specifications:

Pipe diameter: φ508mm~φ1422mm
Pipe length: 8000~12200mm
Wall thickness: 8mm~50mm
Roller transporting speed: 17~26m/min
Printed character height of paint marking machine: 20-40mm/line
Painting dot-matrix: 7×5, 9×7, 10×10, 16×10
Painting lines: 4 lines
Painting speed: 60m/min
Stroke of cylinder for painting head fixed mechanism: 50mm
Moving length of platform: 6000mm
Overall dim.(L×W×H): 1200×850×2100mm

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LSAW PIPE MILL

TIANSHUI METALFORMING MACHINE TOOL CO.,LTD.

Auxiliary devices before forming









- **Features and applications:**
  The main functions of Auxiliary devices before forming is to achieve stepping, continuation, working, fast working according to the requirements of forming machine. The speed of front and back conjuncted roller tables is interrelated to coordinate the forming machine when transporting the steel plate. Auxiliary devices before forming as individual roller table unit is designed and manufactured. The rollers are driven by power, which are drive rollers with independent motor reducer to control the position of steel plate by the switch under the frequency conversion driving.
- **Technical properties:**
  Type of machine：linear arrangement
  Working way：To transport steel plate
  Plate width:1450-4500mm
  Wall thickness：8~5mm
  Plate length：8000~12200mm
  Weight: max.21.2t/pcs.
- **Consisted of :**
  Cross loading and feeding device, Receiving roller, Inlet roller of plate UT detecting machine, Working area roller of plate UT detecting machine, Outlet roller of plate UT detecting machine, Auxiliary roller before milling, Auxiliary roller before pre-bending and Auxiliary roller before forming.

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LSAW PIPE MILL

Plate edge deruster

The machine is used to removal the dust, burr and rusting in the process of milling to keep the cleaning of beveled edges, which is installed after plate edge milling machine and before plate crimping press.



Main specifications:

Pipe width	1450~4500mm	Quantity of brush head	2 pcs.
Wall thickness	8~50mm	Brush wheel diameter	ϕ200mm
Plate length：	8000~12200mm	Brush wheel motor power	3kw
Productivity	1~18m/min	Motor power of machine	12kw
Quantity	2 sets	Weight	3400kg

Chip cleaning device after milling

The device is used to clean the chips after milling .



Main specifications

Name		Specifications
Max. Plate width	(mm)	4500
Wall thickness	(mm)	8~50
Motor power	(kW)	4
Stroke of air cylinder	(mm)	350
Brush width	(mm)	150
Total power	(kW)	4
Overall dim(L×W×H)	(mm)	7400×1000×1100
Weight	(kg)	About2000

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LSAW PIPE MILL

Auxiliary devices after forming

Features and applications:

According to the requirements of technological layout, auxiliary devices after forming can implement the following functions so as to transport the pipe the next working process and realize the continuous production.

- Pipe transportation
- Pipe lifting and rotating
- Pipe rotating without lifting
- Pipe end stopping and stop
- Safe protection on the side of pipe
- Pipe cushion and pre-storing

Technical properties

Pipe diameter：Φ508~Φ1422mm

Wall thickness：8~50㎜

Plate length：8000~12200mm

Weight：Max.21,200㎏/pcs.

Consisted of :

Cross transfer carriage, Pipe transfer carriage, V-Roller, Pipe lifting & rotating roller including hydraulic system, Pipe fixed rotating roller, Stopper for pipe, Side stopper for pipe and Skid.













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Auxiliary devices after forming











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pipe end expander

The machine is used to expand the pipe end of SSAW pipe to improve the diameter accuracy & ovality of pipe end as well as the mechanical property of pipe end material, which is the necessary equipment for oil and gas SSAW pipe mill.



Main Specifications

Parameter \ Model		KJ-14/914(965)×12500	KJ-20/1422×12500	KJ-25.4/1422×12500
Expanded steel pipe		spiral welding pipe	spiral welding pipe	spiral welding pipe
Expanding mode		mechanically expanding	mechanically expanding	mechanically expanding
Range of expanded steel pipe	Diameter (mm)	Φ323.9~Φ914	Φ508~Φ1422	Φ610~Φ1422
	Wall thick(mm)	5~14	6~20	6~25.4
	Max. material	X70	X70	X70
Expanding length	Flat and straight section (mm)	150	150	150
	Transiting section (mm)	100	100	100
Expanding ratio		≤1.5%D	≤1.5%D	≤1.5%D
Production efficiency		less than Φ508mm, 2 min./pcs.	Less than Φ711mm, 3 min./pcs.	Less than Φ813mm, 3 min./pcs.
		more than Φ508mm, 3 min./pcs.	More than Φ711mm, 4-5 min./pcs.	More than Φ711mm, 4-5 min./pcs.
Requirements to pipe body		Conform with the requirements of API spec5L std.,(the 42th edition) to the deviation of pipe body, and the inner welding seam within 250mm from ends of the pipe has been grinded, and the surplus height is no more than 0.5mm.		
Pipe end after expanding	Ovality	0.5%D (on basis of over 0.3% of expanding ratio)	0.5%D (on basis of over 0.3% of expanding ratio)	0.5%D (on basis of over 0.3% of expanding ratio)
	Diameter (measuring on circumference)	$D^{+1.6}_{-0.5}$	$D^{+1.6}_{-0.5}$	$D^{+1.6}_{-0.8}$
Weight (kg)		42000	55000	800000

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LSAW PIPE MILL

TIANSHUI METALFORMING MACHINE TOOL CO.,LTD.

Our customers





References for Oil & gas pipe mill

- ★ Shashi Steel Pipe Works /China
- ★ Julong (Qing country) Steel Pipe Co.,Ltd. /China-Japan
- ★ Hefei Zijin Steel Tube Manufacturing Co.,Ltd./China
- ★ SUDAPET/Sudan
- ★ Swecomex S.A.de C.V./Mexico
- ★ Jiangsu Yulong Steel Pipe Co.,Ltd./China
- ★ Panyu Chu Kong (Jiangyin) Steel Pipe Co.,Ltd./ China
- ★ Baosteel Group Co. Ltd, /China-Japan
- ★ Shengli oil field Longxi Oil Engineering Service Co.,Ltd./China
- ★ Sinopec BSS (Qinhuangdao) Petropipe Co., Ltd./China-Malaysia
- ★ Julong (Nanjing) Steel Pipe Co.,Ltd./China
- ★ Shagang Group/China
- ★ Yangzhou Yalian Steel Pipe Co., Ltd./ China-Canada
- ★ Offshore Oil Engineering Co.,Ltd./China
- ★ Shanghai Zhongyou TIPO (Brastubo) Steel Pipe Corporation/China-Brazil
- ★ SeAH Steel (UAE) LLC./UAE

References for Construction pipe mill

- ★ Tianshui Tianli Steel Pipe Co.,Ltd./China
- ★ Shandong Gaomi Xingyuan Iron Tower Co.,Ltd./China
- ★ Ningbo Zhehua Heavy Steel Pipe Manufacturing
- ★ Co.,Ltd./China
- ★ Huaxi Pipe Manufacturing Co.,Ltd./China
- ★ Southeast Spaceframe Co.,Ltd./China
- ★ Nanjing Daji Iron Tower Manufacture Co., Ltd/China
- ★ Jiangsu Dechuang Tube Making Co.,Ltd./China
- ★ Hebei Aolande Steel Pipe Manufacturing Co., Ltd./China
- ★ Jiangsu Juxin Oil Pipe Co.,Ltd./China
- ★ Changshu Steel Tower Co., Ltd./China

References for SSAW and ERW pipe mill

- ★ Oregon Steel Mills/USA
- ★ Kingland Pipeline Co.,Ltd./China
- ★ Baoji Petroleum Steel Pipe Co.,Ltd./China
- ★ Petroliam Nasional Berhad/Malaysia
- ★ Essar/India
- ★ Blue Dot Properties/South Africa