Bronx straighteners for tubular and long products

“Two 6-roll straighteners to process high-yield stainless steel tubes for Salzgitter Mannesmann Stainless Tubes, France
“Both machines give full satisfaction meeting our requirements in terms of operating performances and straightening quality”

JEAN-CHRISTOPHE CHASSAIGNE
President & Managing Director,
Salzgitter Mannesmann Stainless Tubes, France

“13 Bronx straightening machines in a 30-year relations for Baoshan Iron and Steel Co., China
“We are very satisfied with Bronx machines, they feature ultimate production rate, longevity and excellent standards of straightening accuracy”

CAI FANGWEI
Deputy General Manager of Tube, Pipe and Bar Business Unit,
Director of Equipment & Energy Department,
Baoshan Iron and Steel, China

“6-roll and 10-roll machines to process high-yield, seamless, thick-walled, large diameter tubular products for Zhejiang Jiuli Hi-Tech Metals, China
“It’s our repeated order for Bronx machines in the 10-year working relations. Fives always stays on the top of their contractual commitments, delivering Bronx machines with ultimate production rate, longevity and excellent standards of straightening accuracy”

DENNY LEE (ZHENGZHOU LI)
President of Zhejiang Jiuli Hi-Tech Metals, China

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Fives has been specializing in Bronx straightening machines for more than 80 years

- Robust, reliable and safe design using advanced materials
- Improved accuracy without surface blemishes
- Enhanced rigidity and consistent straightness
- Computer-controlled roll adjustments
Bronx 6-roll and 10-roll straighteners for various applications, engineered for your ultimate success

Main features:
- Excellent production rate
- Equipment longevity
- Ultimate quality of the final product
- Improved accuracy without surface blemishes
- Repeatability of settings
- Automatic precision setting of all work rolls
- Hydraulic lift mechanism avoids damage to the leading end of plain pipe

Designed to sustain the loads associated with the straightening of thick and thin wall, welded or seamless plain or upset tubes and pipes at high speeds, in either hot or cold conditions.

Drive package
Each of the machine’s rolls can be individually driven by gear motors, enabling roll speeds to be monitored and adjusted accordingly to roll wear patterns.

Conventional drive package consists of the singular drive motor coupled with a distribution gear box, providing the drive to a bank of work rolls.

Technical advantages:
- Range of tubular products:
  - Standard
  - Heavy duty, thick wall
  - Seamless or welded
- Diameter’s range: 1mm - 660mm
- Thickness 0.2mm - 60mm
- Yield strength up to 1200 MPa
- Process speed:
  - 6-roll machine up to 90 m/min
  - 10-roll machine up to 240 m/min

Both plain and upset pipes can be processed by the same machine.

Hydraulic lift mechanism fitted to sufficient roll pairs enables upset pipes to be straightened and to avoid damages to the leading ends of plain pipes.

Over 40 references for heavy-duty straightening machines according to the API & GOST standards were installed in the last 15 years in Russia, China, Europe and the Americas.

In 2016, Salzgitter Mannesmann Stainless Tubes, France entrusted Fives with contracts for design and supply of two Bronx six-roll machines, complete with ancillary electrical and hydraulic control systems. Both straightening machines were designed to process high-yield stainless steel tubes up to 280mm in diameter and with wall thicknesses of up to 50mm. The equipment was integrated into an existing space-restricted workshop layout to withstand the arduous loads associated with processing such thick-walled tubes.

“Your company did an excellent engineering work to manage the integration of both machines in our existing lines. I recommend your company as a reference for this type of machines, for its professionalism and outstanding support and services,” stated Jean-Christophe Chassaigne, President & Managing Director, Salzgitter Mannesmann Stainless Tubes, France.
**Bronx bar straighteners**

The Bronx bar machines cover a range from 1.5mm to 300mm in diameter, and possess high throughput speeds of up to 180 meters per minute.

**Main features:**
- The hydraulic roll load control device maintains straightening load throughout the operation.
- COMPASS system enables work rolls and guide bar height adjustment to be set from the HMI screen.
- Improved work roll life and condition, due to the use of through-hardened heat treatment processes.
- Advanced work roll technology, providing greater straightness and ovality condition.
- Work rolls can be re-profiled a number of times.
- Individual adjustment of all work roll axes for any given bar size within the capacity of the machine.
- Designed and pre-assembled in the United Kingdom.

**A one-man operation**

The Bronx bar straighteners are custom-built to suit individual client requirements and bespoke workshop layouts. With its automated handling equipment, the straightening line is a one-man operation.

**Zoom**

Smart machine

**Case study:** Baosteel Special Metals Shaoguan, China entrusted Fives to design and supply a Bronx straightening machine to process high-yield, heat-treated premium quality steel bars. The motorized machine is fully automatic, and able to process steel bars up to 80mm in diameter at operating speeds of up to 75m/minute.

If it’s a very smart machine: all work roll and guide bar functions are set automatically from the HMI panel, located within the operators control desk. Advanced heat treatment processes and profile technology enable the machine work rolls, to provide greater product straightness and ovality criteria, before re-profiling or roll change becomes necessary.

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**Bronx section and rail straighteners**

A wide range of sizes with roll centres from 120mm up to 1800mm to accommodate all section types and high throughput speeds of up to 240 meters per minute.

**Main features:**
- Applications: rounds, squares, hexagons, flats, angles, bulbs, channels, I-beams, H-beams etc.
- High degree of surface straightness and finish.
- Fully automatic and motorized operation: COMPASS system enables work rolls and feed/discharge pinch rolls to be set from the HMI screen.
- Improved work roll life and condition, due to the use of through-hardened heat treatment processes.
- Advanced work roll technology, providing greater straightness.
- Individual adjustment of all work roll axes.
- Easy access to work rolls for inspection and removal.

**Case study:** Fives designed, manufactured and supplied two high-performance Bronx rail straightening machines to Russia’s EVRAZ group, one for Nizhny Tagil Metallurgical Plant (NTMK), the other one for Novokuznetsk Iron and Steel Plant (NKMK).

The project was a challenge, as rail production requires high standards in technologies and metal processing. The engineers had to develop a technology that was able to straighten rails in two dimensions - horizontal and vertical. The Bronx line includes a horizontal straightening machine featuring nine staggered rollers with centres of 1600mm and a vertical straightening machine that has 8 staggered rolls pitched at 900mm between centres and is vertically adjustable to match the pass heights by raising and lowering the four corners. The height adjustment is done with heavy duty jacks that employ a guidance system of large diameter round posts.

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**Zoom**

Customized Bronx rail straighteners
The overview screen shows an overview of the machine and current statuses key to production monitoring. Current speeds, positions and process information relevant to the machine and handling equipment are all displayed to provide the operator with a clear reflection of what is happening on the physical equipment.

**Information displayed on the overview screen includes:**
- Current roll positions and target set-points
- Main drive control and status
- Process information: current and next recipe selection
- Emergency stop status
- Grease system status
- Latest alarm

The COMPASS, computer automatic setting system

The COMPASS software package can be customized to provide management, maintenance and quality control information.

The COMPASS automatically computes the optimum roll settings and adjusts rolls to the proper position:
- Calibration and wear compensation
- Maintenance information
- Fault finding
- Mimic flow diagrams

The system enables tube size changes from minimum to maximum tube diameters to be accomplished in two minutes.

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Engineering advisory services

With a highly experienced group of engineers Fives is able to provide engineering and services to exceed the most demanding expectations.

- Engineering advisory services
- Equipment preassembly and inspection prior shipping
- Installation and commissioning supervision
- Operator training
- Problem solving and troubleshooting

In-house engineering expertise and intellectual property are conceived to guarantee maintenance services of Bronx machines at any age. The sales, project and service teams provide prompt and efficient responses on due time.