

Information

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Watsontown Brick Company
Pennsylvania, USA





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Watsonstown Brick Co., Plant II

Simple and flexible manufacture of stiff extruded facing bricks

In summer 2000 a new plant of the Watsonstown Brick Company in Pennsylvania, USA, went into operation according to schedule. The production capacity of this renowned brick manufacturer has therefore increased by 40 million modular bricks per year. The design of the new plant is simple and flexible. Production is carried out in 8-hour shifts in a 5-day operation for 50 weeks per year.

In 1976 Michael Fisher, owner and general manager of the Watsonstown Brick Company, inherited an old brick-works and decided to renew it completely. It was not easy for him to find suppliers and financiers who took his project seriously, but finally in 1977 together with Lingl he built a new plant with an annual production of 40 million modular bricks which works with the stiff-extrusion technology standard in the USA. Since business has proved successful since then and the outlook is positive, Michael Fisher decided in 1999 that the time had come to double the production capacity. The order for installation of the new production line, again using stiff-extrusion technology to manufacture facing bricks and pavers, was again placed with Lingl.

Production

Shaping

From the stiff-extruded column, which may be sanded or scarred on the surface, slugs are cut off and fed to a lift-through multi-wire cutter, which is equipped with chamfering rollers for all-round chamfering of the green bricks. The slug is cut by lifting it upwards through the wires of the cutting frame.



The row of accurately cut green bricks is pushed off onto a transport belt, where a face-gripper uses the following row to form double layers lying face-to-face. These are placed by a transfer gripper onto a marshalling conveyor, where the bricks are spaced out, grouped and fed to two robots for loading the tunnel kiln cars.

Drying and firing

The single-track tunnel dryer is located next to the tunnel kiln and can accommodate 23 kiln cars. It is heated mainly with hot air from the tunnel kiln, which is recirculated by fans in the ceiling of the dryer. The drying time is 25 hours.

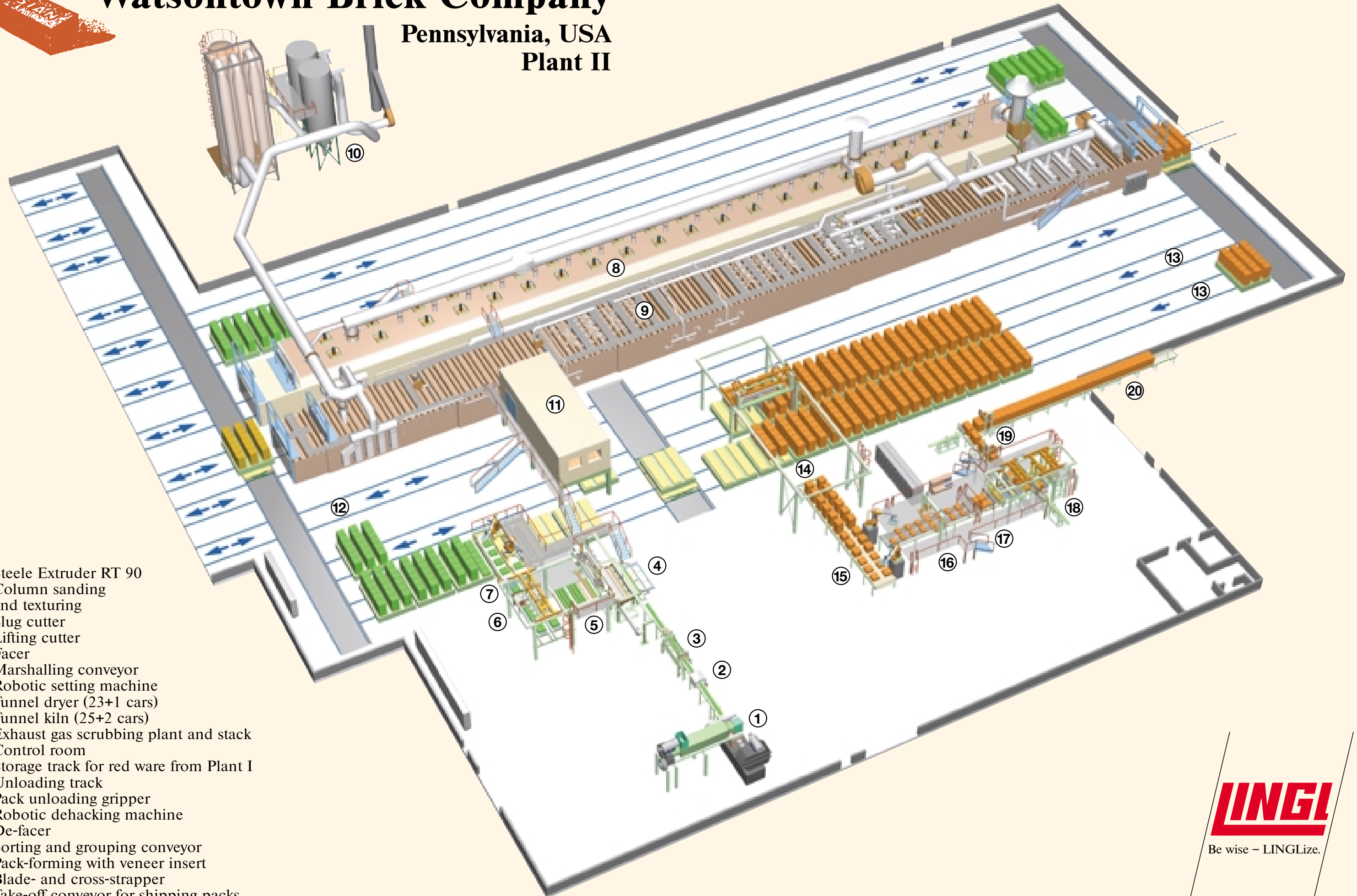
The combined side-fired and top-fired tunnel kiln, with a length of around 85 m, is designed for a daily capacity of 263 tons of modular bricks and equipped with a burner group for reduced firing, so that flashed bricks can also be produced. The firing channel is 4.37 m wide and 1.42 m high. The firing temperature is 1100 °C with a throughput time of 28 hours.





Watsontown Brick Company

Pennsylvania, USA
Plant II



- 1 Steele Extruder RT 90
- 2 Column sanding and texturing
- 3 Slug cutter
- 4 Lifting cutter
- 5 Facer
- 6 Marshalling conveyor
- 7 Robotic setting machine
- 8 Tunnel dryer (23+1 cars)
- 9 Tunnel kiln (25+2 cars)
- 10 Exhaust gas scrubbing plant and stack
- 11 Control room
- 12 Storage track for red ware from Plant I
- 13 Unloading track
- 14 Pack unloading gripper
- 15 Robotic dehacking machine
- 16 De-facer
- 17 Sorting and grouping conveyor
- 18 Pack-forming with veneer insert
- 19 Blade- and cross-strapper
- 20 Take-off conveyor for shipping packs



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Unloading and packaging

After firing, the tunnel kiln cars are pushed alternately onto two adjacent unloading tracks and fed to a pack unloading machine. The advantage of this arrangement is that firing packs can be unloaded alternately from one track and the other, in order to balance out any color differences arising from the firing process and also to mix colored bricks.

Between the kiln and the unloading tracks is a buffer track, via which kiln cars from the neighbouring older plant can be conducted to the unloading track, so that they can be automatically unloaded there as well.

The firing packs are dehacked by two robots and singled into layers by a defacing gripper. After this, the bricks are sorted and the layers regrouped and supplied to a transfer gripper which stacks them into shipping packs. During this process, thin veneer wood strips are inserted over the layers containing holes for the forklift truck. The brick packs are then pushed through a first strapping machine which straps each individual brick blade in the pack. On the following transverse transport conveyor, the brick pack is strapped vertically once and then stored for removal by the forklift truck.



All machinery and plant components are controlled by a Simatic S7 automation unit with Lingl software. For the operation of the dryer and the tunnel kiln, a Lingl process control system based on PCS7/WinCC is used.





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Technical Data

Plant with stiff extrusion technology for direct setting of the green bricks onto the kiln cars

Production: Facing bricks and pavers
Capacity: 263 t/day, 40 million bricks in 50 weeks
Reference size: Modular brick, 2.3 kg fired weight
Staff: 4 people: 1 man for wet side,
1 man for dryer/kiln,
2 men for unloading/packaging
Working times: 8 hours/day, 5 days/week, 50 weeks/year

Lingl tunnel dryer

Dryer length: 78.43 m
Vestibule: 3.41 m
No. of tracks: 1
Cars in dryer: 23 + 1
Drying time: 25 hrs
Shrinkage: 4.5 %

Lingl tunnel kiln

Top and side firing with natural gas,
burner group for reduced firing
Kiln length: 85.25 m
Vestibules: 2 x 3.41 m
Firing channel: 4.37/1.42 m
Cars in kiln: 25 + 2
Firing time: 28 hrs
Firing temperature: 1100 °C

Plant controls

Machinery and transport system: Simatic S7 automation unit with Lingl software
Tunnel dryer and tunnel kiln: Lingl process control system based on PCS7/WinCC