

SR Schindler, 93057 Regensburg, Germany

New value-adding plant at Proan in Mexico

In August 2022, the Mexican company Proan ordered a stand-alone value-adding line with SR Schindler. Proan, a family-owned company, was founded in 1950 and consists of many different divisions with more than 10.000 employees. The headquarters is located in San Juan de Los Lagos. With a block plant from a European supplier, Proan started paver production in 2021. For the 400th anniversary of San Juan de Los Lagos, it is involved in new construction projects and decided to invest in a value-adding line. In the future, Proan plans to expand concrete stone production and deliver beyond the borders of Mexico.

Line Concept

The fully automated stand-alone SR Schindler value-adding line consists of an infeed conveyor and cuber for transporting stone layers to the value-adding line with the aging machine, shotblaster, curling machine, and coating equipment. The machines are arranged linearly, one behind the other, with handling and transport devices in between. After the finishing process, the stone layers get stacked by a second cuber on transport pallets, and a conveyor transports the stone packs horizontally and vertically, strapped to the pick-up position by the forklift.

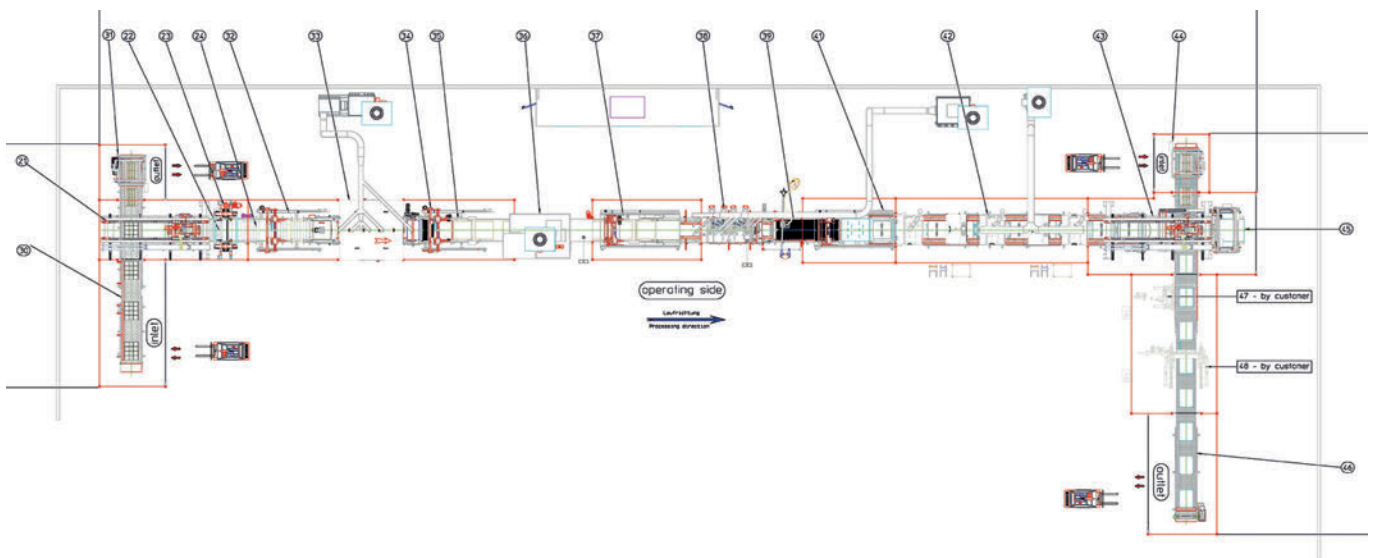
The entire plant is designed for block layers, respectively, for wall and hollow block layers, with maximum dimensions of 1,200 x 1,200 mm.

The design of infeed and outfeed conveyors allows different types of empty pallets to be fed and transported.

Value-adding line: Aging - Shot blasting - Curling - Coating

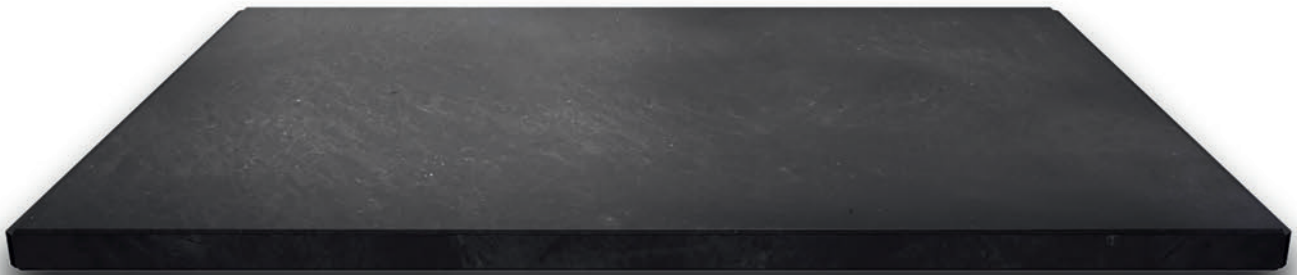
Cuber pos. 21 removes the stone layers from the pallets, which a slat conveyor transports to the exact position directly below the cuber. With an electromotive-driven 4-sided clamp, the individual stone layers get deposited on the finishing line. For tilting of wall stones and hollow block stones row per row, a 90° tilting device is installed. That way, the visible face of these products can be processed. A following layer pusher pushes the layers in an endless row into the SR Mega 6000-C-Duo aging machine. The emptied transport pallets get stored in a magazine, and empty pallet stacks are transported by forklift to a magazine on the packaging side of the line. This magazine feeds the pallets onto the slat conveyor, which transports them to the loading position of the second cuber pos. 43.

The products pass through the Mega 6000 -C-Duo high-performance machine via the conveyor belt provided on the machine side. Above this, two machine bridges are arranged, each with lateral support for taking up an aging unit. The machine is designed as a heavy steel construction. The two processing supports can be moved vertically pneumatically, and each is equipped with a hammer device that oscillates



Layout

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lateral movement. The hammering devices comprise 105 hard-metal aging tools arranged out-of-line on six quick exchange carrier beams.

Using an additional foil dispenser, a foil can be inserted between the products and the aging hammers. During the operation of the aging machine, the foil is situated between the product's top surface and the aging tools and is conveyed through the machine synchronously with the products. The foil travels between the product layers and the hammers during processing, preventing surface damage. So, only the edges will be broken.

To protect the employees from the high noise level caused by the aging machine, the client installed a noise protection chamber for this machine. A cartridge filter system extracts the dust generated during processing.

Via a two-meter-long retarding roller chain conveyor and a layer pusher with a transfer table, the aged products are then transported in layers to the shot blasting machine Type SR-1250.

In the shot blasting machine equipped with a rubber conveyor belt with transverse ribs, the products are shot blasted

with steel or stainless-steel balls via two turbines, each equipped with an 18.5 kW frequency-controlled motor. This process roughens the stone surfaces and makes the natural stone protruding. By means of an integrated high-pressure blower, the abrasive remaining on the surface is automatically removed from the products. It is then fed by a longitudinal screw conveyor to the bucket elevator and, from there, to the abrasive cleaning unit. After cleaning, the abrasive can be fed into a new shot blasting process.

When the conveyor belt stands still, the abrasive supply to the turbines is automatically interrupted. This ensures that the blocks are not over-blasted and no rejects are produced.

Another layer pusher transports the shot-blasted products again in an endless row into the following curling machine CA-1200-4, including a blowing device at the machine's exit for cleaning the concrete products. Proan opted for a curling machine consisting of two tunnel segments, each with two curling stations equipped with an approx. 22 kW frequency-controlled motor. The four curling brushes are all carborundum-tipped. The degree of hardness of the brushes varies, so a perfect result can be achieved using different equipment from the stations. The supports are height-adjustable by an electric motor. The current consumption of the brush



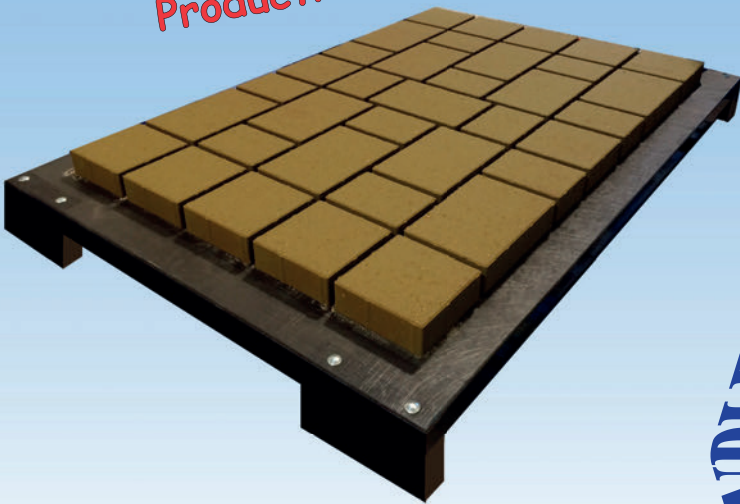
Aging machine



Shot blasting machine

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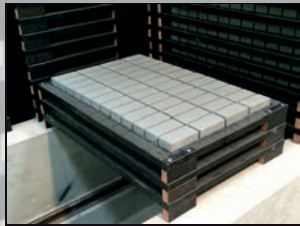
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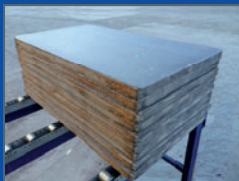
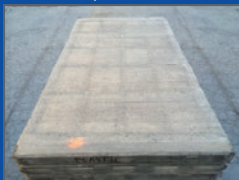
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drive automatically controls the brush contact pressure. In this way, even the pressure of the brushes on the products is achieved, and the wear of the brushes is balanced. As soon as the belt stops in the curling machine, the brush supports are automatically raised, thus avoiding an irregular surface of the products.

The curling stations are mounted at an angle to the conveying direction with different numbers of degrees. Likewise, the brushes run in the alternating direction of rotation, i.e., brushes 1 and 3 run opposite to brushes 2 and 4. This prevents line marks and any irregular surface structure of the products. As a result, the best possible and consistent quality is achieved during curling.

The curling machine is controlled via a Siemens SPS-S7 control system. It is operated via a 12"-touch panel mounted on a swivelling cantilever system. The dust extraction is done via a cartridge filter system.

After curling, the products are transported further via a retarding roller chain conveyor. This is used to control the quality of the treated products. Defective products can be easily removed by a vacuum crane and exchanged for quality products.

The products are now transferred to the coating line via the subsequent layer pusher. The products to be treated are conveyed through the individual stations of the coating line by an approx. 28-meter-long special conveyor system. The pushing bars of the special conveyor system are working in both directions. When a layer gets pushed forward and positioned, the bar dives under the docking plate at the inlet to pick up a new layer.



Curling machine

First, the products must pass the infrared preheating tunnel equipped with six heater cassettes, each with seven infrared lamps, in which they are heated to the correct temperature to be sprayed from the top with solvent-free primer in the subsequent spraying station. In the following infrared heating tunnel, the products primed from the top are now dried with six heater cassettes, each with seven infrared lamps. The spraying and final drying process returns when the solvent-free sealer gets sprayed and dried. A suction system removes the automated spray.

Packaging

A combined foil feeder for intermediate and cover foil with an additional granulate feeder is installed at the layer stacking position to protect finished stone surfaces. Here, a foil or granulate gets applied between the stone layers or between the stone layer and the pallet, respectively, on top of the stone packs. The intermediate layer or the granulate protects the products from scratching each other and the surface damage caused by this, such as the top cover foil against the weather.

The changeover between the intermediate layer and the top cover foil is done automatically. The middle layer can be a net, a foil, or similar. The stone packs finally pass a horizontal and a vertical strapping device, which the customer provided.

Electric control

Several Siemens PLC S7-1500 control the entire value-adding and packaging line with two stationary operator panels and two wireless tablet PCs with visualization.



Coating line



Finished products

Final Remark

The installation of the SR Schindler value-adding line exemplifies Proan’s strategic step toward enhancing production efficiency and market expansion within the concrete industry. By investing in advanced technology and expanding its production capabilities, Proan is positioning itself to serve its customers better and explore new market opportunities. This collaboration reflects Proan’s focus on staying competitive and adapting to the evolving needs of the industry, ensuring its continued success in the years to come. ■



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