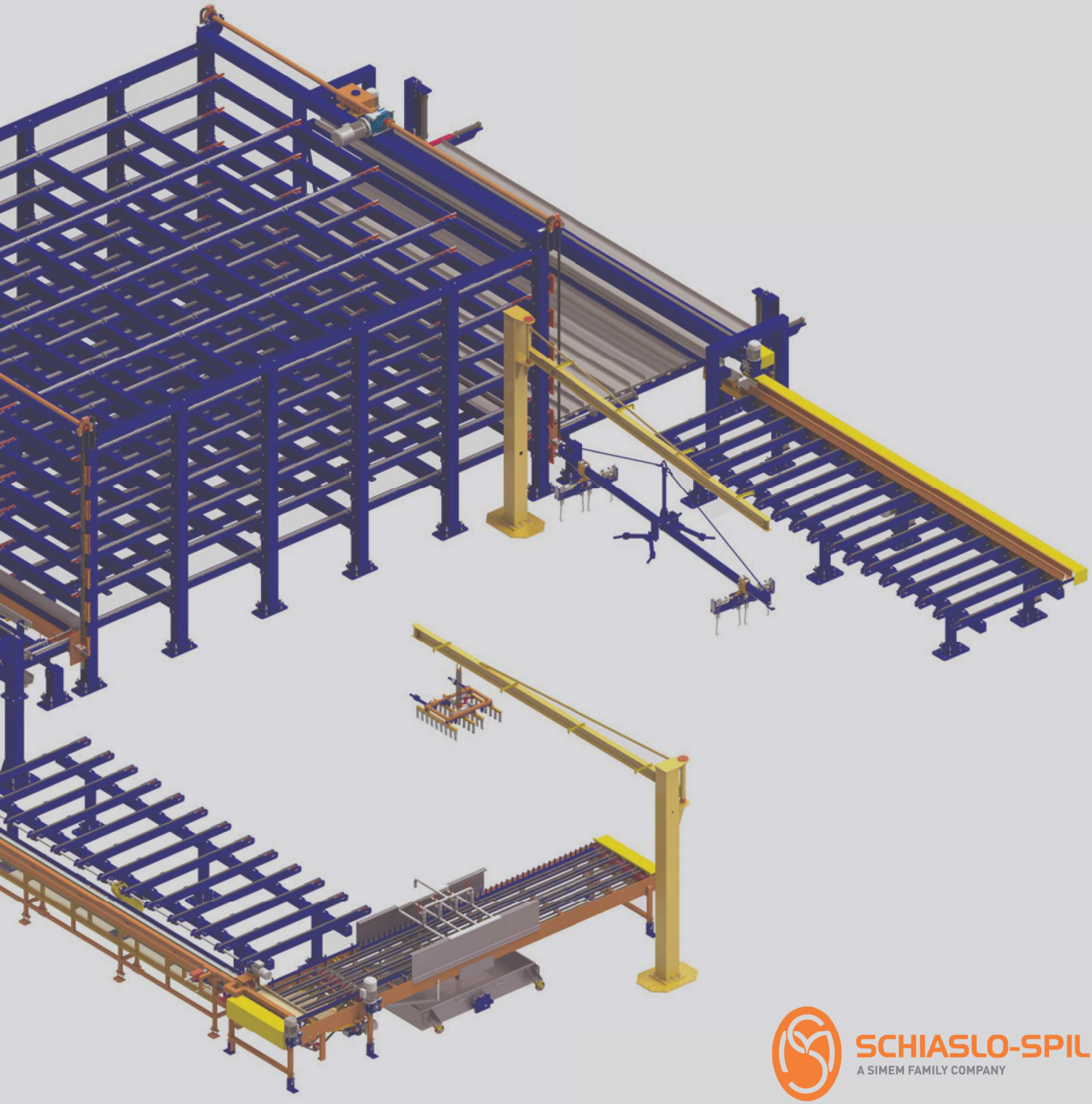
BRICKBEAM

C.C.G.S. 85/280
Brick-cement beams and lintels system.

Compact machinery to produce brick-cement lintels and brick-cement lattice girder beams.



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The machinery is designed to produce various types of brick-cement items, reinforced with loose bars (i.e. bars that are not pre-stressed).

Special features of the brick-cement items

These items are **structural**, more precisely:
- lattice girder beams used for the ceiling structure
- lintels used above doors and windows.

These all feature a **reinforced concrete core, embedded into a brick shell.**
The brick shell consists of a well-aligned set of equal modules, up to 50cm long, in bricks, called "rafter shaping blocks" or "bottom bases".

Brick-cement items have their own specific features.

In general:
- they improve the structure's soundproofing and thermal insulation
- they improve the structure's breathability
- they improve aesthetics in "exposed brickwork".

Technically:
- it is correct to match normal brickwork items (interposed filler blocks, hollow bricks) with these specific structural brick-cement items: **both have the same hygroscopic behaviour** and this prevents dark spots that appear on the plaster in correspondence to all-concrete items due to moisture changes
- it is required to prevent reinforcements from coming in contact with the brick shell: **in full compliance with standard EN15037**, which requires minimum concrete enclosure around reinforcements to protect them from oxidation.

Machinery composition

The machinery consists of a series of identical **metal trays, with "L" section**, sequentially moved, between the operative stations.

The brick and reinforcement feeding stages are collected in an automatic line, **consisting of two manual operative stations:**
- in the first station the operator loads the brick on the suitable corner feeder, performed by a first operator equipped with suitable clamps and electric hoist
- operations to load the formwork are carried out by a second operator, working in a suitable station, obtained along the feeding line.

After automatic loading of the bases in the empty tray, tray movement unfolds like a closed loop assembly line.
All tray movements are carried out automatically, within the machinery, according to a pre-set sequence, in a simple and fast manner:
- from the packaging stages
- to the stage of cleaning and recovering the empty trays.

The operative stations are in a fixed position, and a specific production stage is performed at each station.
The main operative stations are:
- brick loading station, **requires operator**
- framework station, **requires operator**
- casting and vibrofinishing, station automatic
- curing station automatic
- demoulding station, automatic
- unloading station, automatic
- stacking station, **requires operator.**

Special features

Normativa EN 15037
The use of metal trays together with the suitable spacers to support the reinforcement bars assures the required enveloping of the metal reinforcement, in full compliance with European standards on reinforced concrete items, with regard to protecting reinforcement from oxidation.

Tower Magazine for curing
The machinery includes a suitable tower curing magazine, **consisting of 7 superposed levels.**
In this way:
- the metal trays always remain housed on the machinery, removing the need for external handling, typically slow and manual
- the machinery's overall dimensions is minimum, much less than the overall dimensions of machinery with equivalent performance
- the machinery's overall dimensions are very compact.

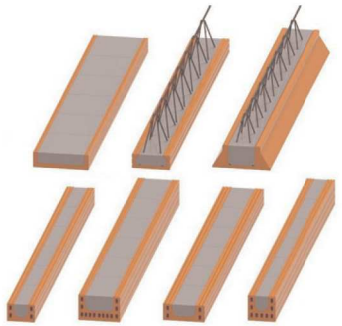
Typical size of the items

Length:
From 120 cm to 840 cm, i.e. up to the useful length of the tray, considering that nothing may protrude from the heads.
In the same tray it is possible to produce many aligned items, in a single row, up to covering the entire tray length.

Width
From 6 cm to 27 cm nominal, i.e. up to the useful tray length. The items contained in a single tray must all have the same width, and each tray may contain a single row of items.

Height
From 4 to 15 cm, a different steel spout is supplied for each different height, suitably shaped to dispense the concrete.

Overall height
20 cm at most, which corresponds to the free height between the 7 levels of the tower magazine.



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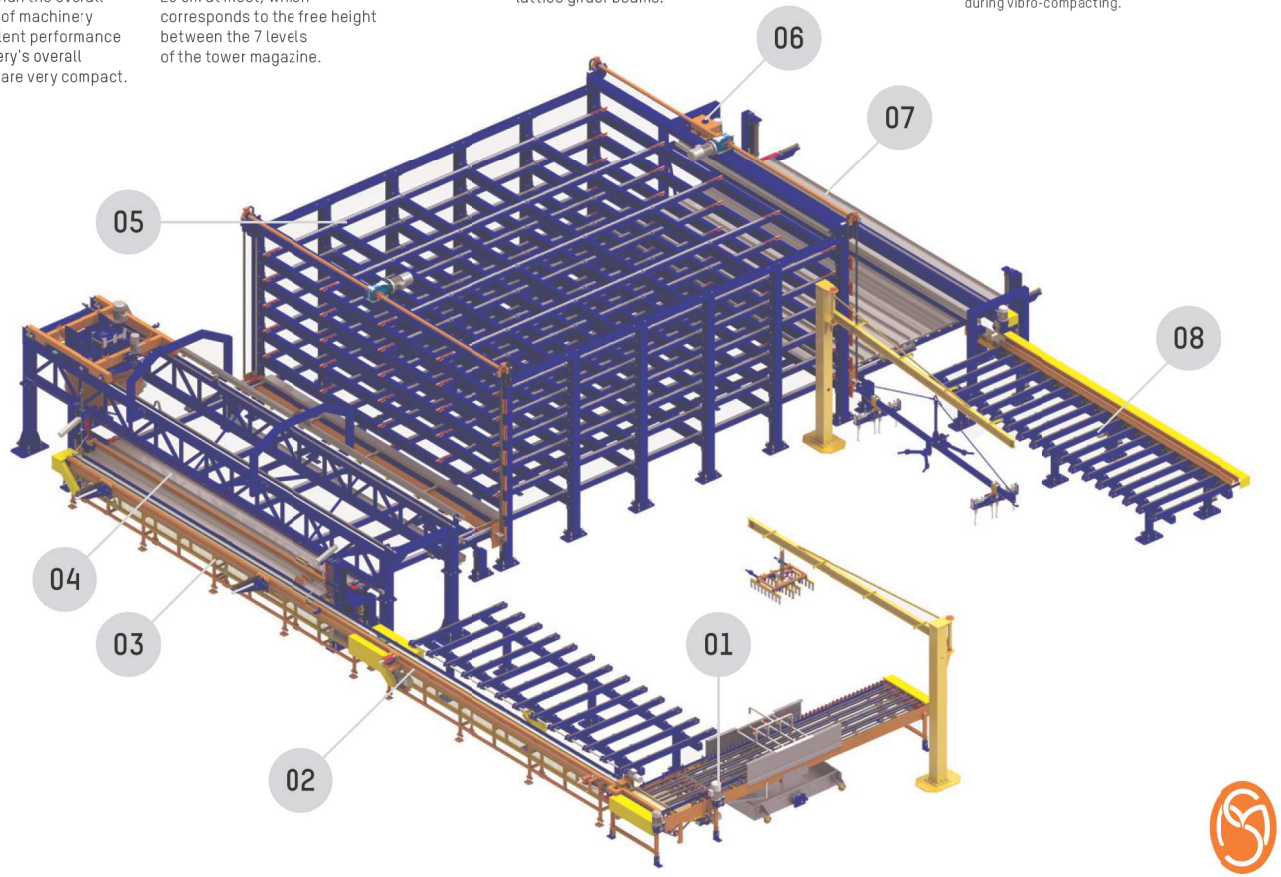
Compact machinery to produce brick-cement lintels and brick-cement lattice girder beams.



01 **Brick feeder**, with jib crane for manual loading. The operator loads an entire level of bases, as taken from the pack. The feeder includes the wetting pump and the device to turn the bases upside down.

02 Feeding line of bases and reinforcement. It includes the **framework station**, with suitable front loader for bars and lattice, consisting of 16 motorised chains.

03 **Initial head**, including elevator for empty trays, which automatically lifts the tray to the operative level, and the pusher with 8.5 m long bar which automatically moves over sideways and loads on the tray the dry reinforced bases.

04 **Casting and vibrofinishing station**, includes the self-propelled automatic batching carriage, mobile on its own gantry tracks, and the vibro-compacting devices.
To manage various shapes of bases, a suitable pneumatic device automatically descends and moves against the free side of the bases, automatically adapting to the real width of the bases, to assure stability and alignment of the items, during vibro-compacting.

05 **TOWER curing magazine**, with 7 levels, including the elevator with automatic pusher that loads the trays in the tower and the lowerator with automatic extractor, that picks the trays after curing.

06 **Demoulding station**, includes the mobile self-propelled carriage on its own gantry single track, with extractor designed to extract from the head the row of items, one tray at a time. It includes motorised brusher and the device to distribute the release oil on cleaned trays.

07 **Final head**, with automatic station for recovering the cleaned trays, it includes the lowerator that lowers one tray at a time to the lower level, where the tray is taken back to the initial head.

08 **Unloading line** with jib crane for manual stacking. The items extracted by the extractor are automatically moved into the motorised belt that takes them and aligns them for unloading. Unloading is performed sideways by an 850 cm long bar, which transfers the row of items from the motorised belt to the unloading table. The unloading table consists of a motorised set of 16 parallel belts, with stainless steel slats, that guide and collect forward the lines of items. At the end of the belts, using the jib crane by using suitable interchangeable forks (based on the type of item) the operator picks the finished product and stacks it, ready for transport to destination.

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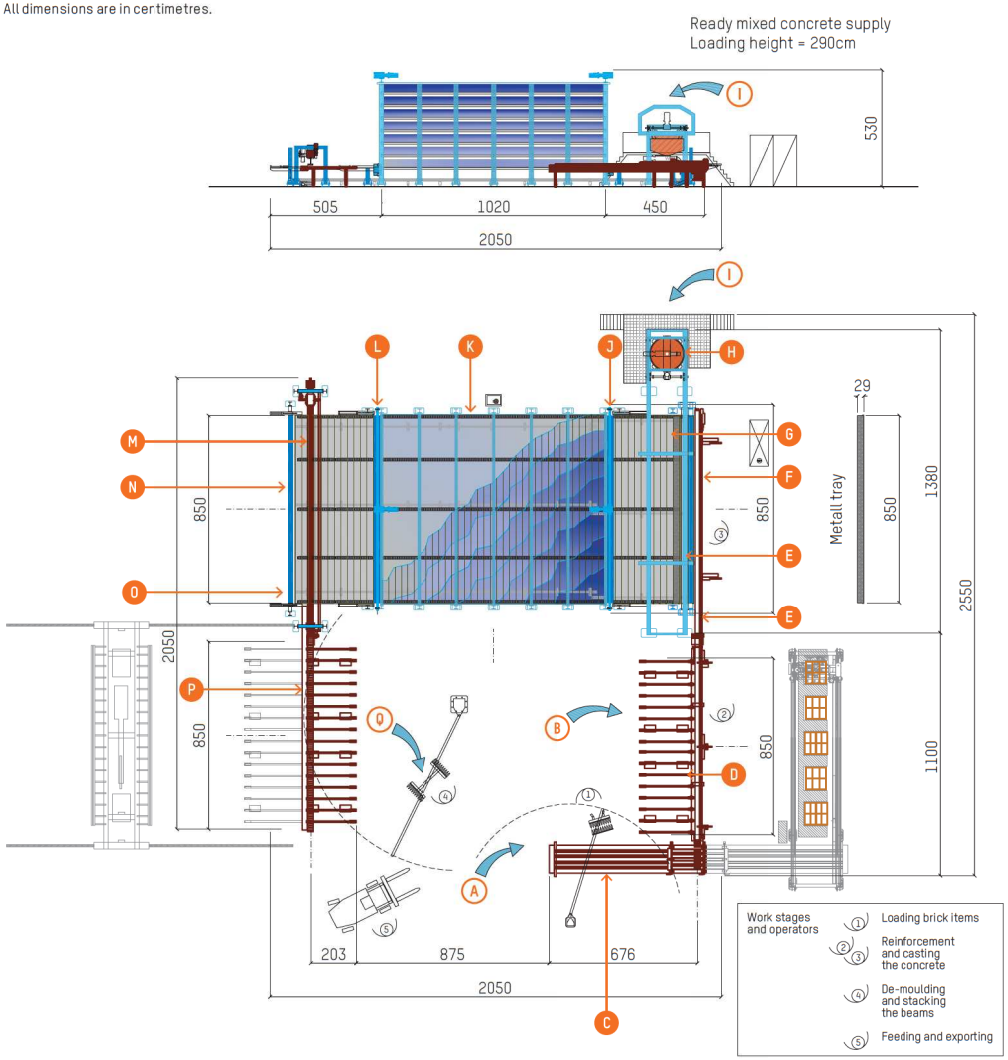
All dimensions are in centimetres.



- (A) Brick supply
- (B) Reinforcement supply
- (C) Manual brick loading station, the first operator picks the bases from the pack and directly loads them onto the corner feeder, using the jib crane with suitable forks
- (D) Manual reinforcement station, the second operator picks the bars and lattices from the feeder
- (E) Feeding line of dry reinforced bases
- (F) Packaging station, the third operator supervises transfer of items on the trays and subsequent casting and vibro-compacting stage. They help the second operator to handle the heavy reinforcements
- (G) Automatic casting and vibro-finishing station
- (H) Self-propelled batching carriage, mobile on its own gantry track
- (I) Concrete supply
- (J) Elevator to load the tower magazine
- (K) Magazine tower curing magazine with 7 levels
- (L) Lowerator to unload the tower magazine
- (M) Self-propelled extractor carriage, mobile on gantry track, it extracts the row of items from the tray, one at a time. It includes brusher and oiler to clean the tray immediately after emptying
- (N) Final head, with empty tray lowerator
- (O) Lower conveyor belt, recovers empty and cleaned trays
- (P) Item reception line, the pusher moves the rows onto the motorised unloading plane, consisting of 16 chain lengths with stainless slats
- (Q) Manual unloading station, the fourth operator picks and stacks the items, using the jib crane with interchangeable forks

Features

Features of the items
Minimum length
80 cm in conformity with the stacking forks
Maximum length
840 cm in conformity with tray length
Minimum width
6 cm
Maximum width
25 cm in conformity with tray width

Features of the Bricks
Minimum height
4 cm
Maximum height
18 cm

Overall machinery dimensions

Lenght
21 m
Width
26 m
Height
5,5 m

Metal trays

N. 280 vassoi trays with "L" section

Lenght
8,5 m
Width
29 cm
Height
5 mm

Time

Cycle time
on average 120 seconds/tray
Hourly productive capacity
200 m/hour,
equal to 30 trays/hour

Daily productive capacity
2000 m/day in 10 hours
of work using n.280
80% filled trays on average

Manpower

1 or 2 teams consisting
of 5 workers, of whom:
4 workers on the machinery
1 worker with forklift truck

Raw material used to produce 200 m/hour

Brick beam moulder
200 m/hour
Concrete
1600 litres/hour, divided into n.4 400 litre refills
Lattice
200 m/hour, already cut to measure

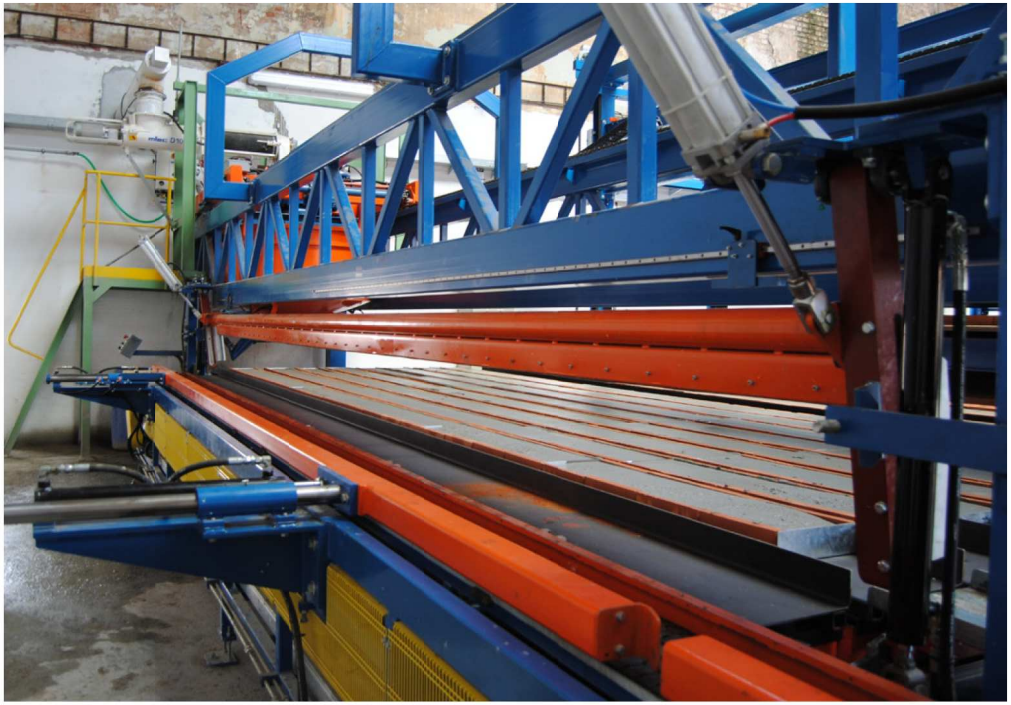
Reinforcement bars
approx. 400 m/hour, already cut to measure in various diameters
Power
Installed power 52 kw
Consumption 15 kwh/hour
(daily consumption 135 kwh)

End-of-day washing

7 bar compressed air
approx. 300 l/day
Washing water
approx. 200 l/day

Concrete hopper

Capacity
800 l (1000 litres flush)
Loading height
290 cm



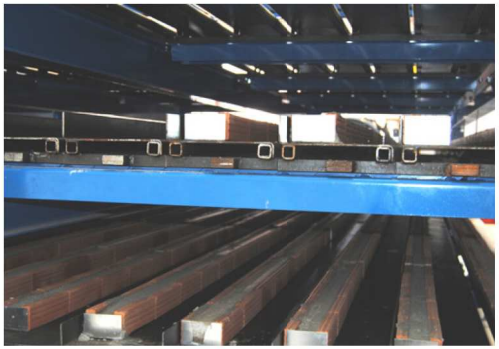
↑ Sideways pusher with bar to load one row of items in the empty tray.

← Curing magazine unloading side and self-propelled carriage with extractor in the background.

↑ The device for tipping over and straightening the bases.

← The self-propelled batching carriage, on its own overhead track .

↓ Intermediate levels of the tower magazine.



↓ The unloading table with a row of items just extracted.

SCHIASLO-SPIL
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Operating headquarters
Schiaslo-Spil s.r.l.
via Milano, 2 - I 31048
Olmi di San Biagio
Treviso - Italy
p. +39 0422 899129
f. +39 0422 899682
info@schiaslo-spil.com
www.schiaslo-spil.com