

Turnkey handling system for prefabricated wall panels



The Project

Architectural Framing Systems (AFS) sought to update their prefabricated wall panel manufacturing facility to increase output and reduce manual handling. Presently AFS' manufacturing methods require substantial manual handling of various sized prefabricated wall panels and involve significant amounts of avoidable manual handling. This project involved the replacement of two existing manufacturing lines with a new system incorporating the following scope:

- Enable easy access to larger quantities of raw materials
- Pressing of panels to ensure good glue adhesion
- Baking of panels for curing of glue
- Stacking of panels in readiness for manual stretch wrapping after the end of the line (manual due to extreme size of parts)
- Safety fencing and guarding to comply with AS 4024.1
- Electrical programming and automation for automated control of the entire system

Pallet Conveyor | Slat Conveyor | Belt Conveyor | Safety System | Automation



The Result

Australis Engineering two new production lines incorporating the following outcomes:

- Design and manufacture of two adjustable height trolleys (pneumatic powered) to facilitate the handling of 'raw' panels differing in size from 250x1000mm to 1100x4200mm. This included an in-floor track system for guidance and easy loading by forklift.
- Design and manufactured a 6 strand infeed conveyor system, (to accommodate vast differences in panel sizes) that also incorporates a pneumatically operated datum station. This datum station is used to assemble the panels to ensure they are square before they are transferred into the system.
- A transfer system to handle different size panels using slat chain and chain driven roller conveyors.
- Belt conveyor press station with fully controllable pressure and speed, to press panels together for good glue adhesion.
- Automated multi stage oven system, with powered roller conveyors for glue curing.
- Automated machine incorporating industrial magnetics to stack panels up to 1.75m high (also has to accommodate the full variety of product mix in any given stack, including to accommodate for wide ranging differences in length, width and thickness of the AFS wall panels).

Australis provided a turnkey solution that improves worker OHS, improves throughput and manufacturing accuracy whilst reducing, unnecessary handling from the manufacturing process (with particular reference to forklift movements).

Innovation

A key element of the Australis solution has been the design, manufacture and installation of the following items:

- Automated, fully controlled belt conveyor pressing station.
- Automated multi-stage temperature controlled oven system for glue curing.
- Servo driven magnetic Panel Stacking System capable of stacking large variations in product size at any time and with a high degree of accuracy (see over page for more information).

Client:

Architectural Framing Systems

Location:

Goulburn, NSW Australia

Customised infeed conveyors

Slat conveyors

Belt conveyors

Powered roller conveyors

Pallet Conveyors

Panel Stacker

Automated Controls

Integrated curing oven

Aluminium profile trolleys

Safety System

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Panel Stacking System

By upgrading the infeed and oven sections of the manufacturing line, AFS highlighted an additional need to automatically stack the completed, prefabricated wall panels prior to stretch wrapping.

Australis Engineering was able to propose an additional solution that was designed to meet the following scope of work:

- Able to accommodate all different panel sizes without any change parts, and be able to stack different sizes within the same bundle.
- Handle widths from 250 to 1100mm, lengths from 1000 to 4200mm and thicknesses from 100 to 265mm.
- System to be fully automated, and able to transport out completed stack ready for new panels.
- Safety fencing and guarding to comply with AS 4024.1
- Electrical programming and automation for stacking machine, and integration with existing system.

The Result

By working in cooperation with AFS to ensure that key parameters for achieving perfectly stacked wall panels were achievable, Australis Engineering was able to successfully design, manufacture and install a unique panel stacking system including the following:

- Designed, manufactured and installed two fully customised and automated servo controlled stacking machines.
- The stacking machine's head was custom designed to enable AFS to stack panels of differing sizes, from 250mm x 1000mm to 1100mm x 4200mm, as well as thicknesses ranging from 100mm to 265mm.
- Because of product structure differences, a specialised magnetic pickup head was designed, with adjustments for width, length and height.
- Servo driven magnetic stacking machine capable of stacking large variations in product size at any time and with a high degree of accuracy.

